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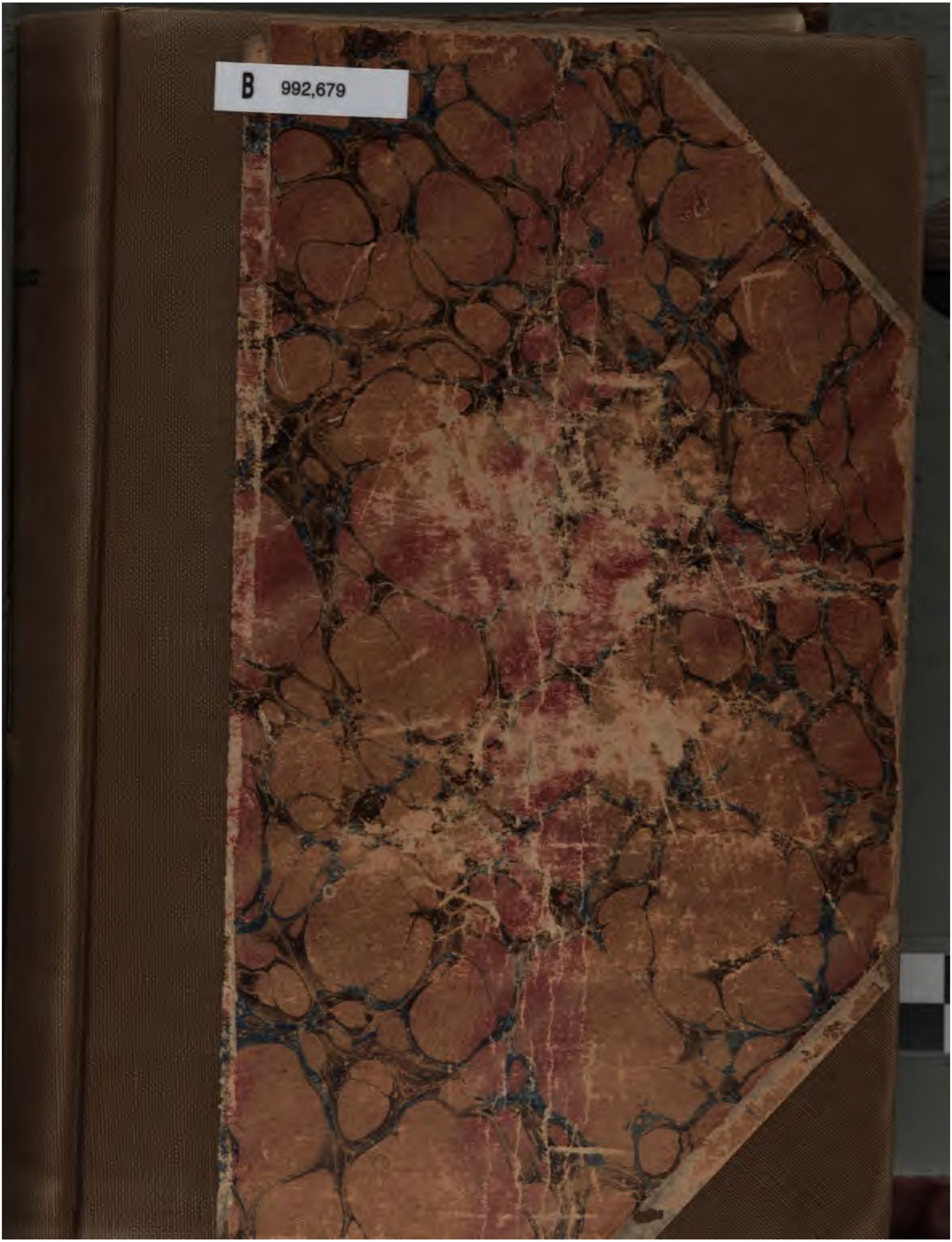

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CONTENTS OF VOLUME 3

ARTICLES

PAGE
Man's Place in Nature. W J McGee 1
Certain Gambling Games of the Klamath Indians. George A. Dorsey 14
Laboratory Outlines for Use in an Introductory Course in Somatology. Frank Russell 28
Sophiology, or the Science of Activities Designed to Give Instruction. J. W. Powell 51
The Chukchi of Northeastern Asia. Waldemar Bogoras . . 80
The Technic of Aboriginal American Basketry. Otis T. Mason. 109
Memoranda on the Maya Calendars Used in the Books of Chilan Balam. Charles P. Bowditch 129
The Ill Health of Charles Darwin—Its Nature and its Relation to his Work. W. W. Johnston 139
Obituary of George Mercer Dawson. W J McGee . . . 159
The Owakülti Altar at Sichomovi Pueblo. J. Walter Fewkes . 211
Chalchihuitl in Ancient Mexico. Zelia Nuttall . . . 227
Notes on the Alsea Indians of Oregon. Livingston Farrand . 239
Kootenay Group-drawings. Alexander F. Chamberlain . 248
Ethnology in the Jesuit Relations. Joseph D. McGuire . . 257
Rare Books Relating to the American Indians. Ainsworth R. Spofford 270
Summary of the Archeology of Saginaw Valley, Michigan.—I. Harlan I. Smith 286
Mummification, Especially of the Brain. D. S. Lamb . . . 294
Decorative Symbolism of the Arapaho. A. L. Kroeber . . 308
Initiation Ceremonies of the Wiradjuri Tribes. R. H. Mathews. 337
The Development of Illumination. Walter Hough . . . 342
Use of Textiles in Pottery Making and Embellishment. W. H. Holmes 397
The Categories. J. W. Powell 404
Antler-pointed Arrows of the Southeastern Indians. Charles C. Willoughby 431
The Lesser New-fire Ceremony at Walpi. J. Walter Fewkes . 438

PAGE
An Eskimo Brain. ALEŠ HRDLIČKA 454
Summary of the Archeology of Saginaw Valley, Michigan.—II. HARLAN I. SMITH 501
Arrow Wounds. THOMAS WILSON 513
Mexican Codices—A List of Recent Reproductions. M. H. SAVILLE 532
Classification of the Sciences. J. W. Powell 601
The Aborigines of the Province of Santa Marta, Colombia. FRANCIS C. NICHOLAS 606
The Lodges of the Blackfeet. GEORGE BIRD GRINNELL . . 650
Significations of Certain Algonquian Animal-names. ALEXANDER F. CHAMBERLAIN 669
Aboriginal Copper Mines of Isle Royale, Lake Superior. WILLIAM H. HOLMES 684
On the Age of Maya Ruins. CHARLES P. BOWDITCH 697
A Painted Skeleton from Northern Mexico, with Notes on Bone Painting among the American Aborigines. ALEŠ HRDLIČKA. 701
Summary of the Archeology of Saginaw Valley, Michigan.—III. HARLAN I. SMITH 726
Recent Progress in Anthropology at the Field Columbian Museum. GEORGE A. DORSEY 737

BOOK REVIEWS

LUMHOLTZ: Symbolism of the Huichol Indians (*Mooney*) . . . 164
WOOD: The Political Economy of Humanism (*Peters*) . . . 167
KLUGMANN: Vergleichende Studien zur Stellung der Frau im Alterthum (*Casanowicz*) 170
FOY: Tanz Objecte vom Bismarck Archipel., Nissan und Buka (*Mason*) 172
WIRTH: Volkstum und Weltmacht in der Geschichte (*Mason*) . 173
WIKLUND: Om Kalevala, Finnarnes nationalepos och forskningarna rörande de detsamma (*Gatschet*) 174
MEYER and PARKINSON: Album of Papúa-Types, II (*Hodge*) . 174
BUREAU OF AMERICAN ETHNOLOGY: Seventeenth Annual Report, 1895–96 (*Chamberlain*) 353
BUREAU OF AMERICAN ETHNOLOGY: Eighteenth Annual Report, Part I (*Chamberlain*) 358
LEÓN: Apuntes para una Bibliografia Antropológica de Mexico (*Chamberlain*) 359
NUTTALL: The Fundamental Principles of Old and New World Civilizations (*Wilson*) 360

PAGE
MOONEY: Calendar History of the Kiowa Indians (*Matthews*) . 542
ROTH: Strings and other Forms of Strand (*Mason*) 544
MORTIMER: Peru: A History of Coca (*Hagar*) 545
CODEX FEJÉRVÁRY MAYER: Manuscrit Mexicain Précolumbien des Free Museums de Liverpool Publié par Le Duc de Loubat (*Saville*) 546
HERRON: Explorations in Alaska (*Mooney*) 547
DRÄHMS: The Criminal, his Personnel and Environment (*Baker*). 548
WHITE: How to Make Baskets (*Mason*) 549
HOERNES: Primitive Man (*Mason*) 549
RIVERS: Report of the Cambridge Anthropological Expedition to Torres Straits. Vol. II, Physiology and Psychology; Part I, Introduction and Vision (*Burnett*) 751
BARROWS: The Ethno-botany of the Coahuilla Indians of Southern California (*Jenks*) 754
ROTH: The Structure of the Koko-Yimidir Language (*Chamberlain*). 756
FOOTE: Government Museum, Madras. Catalogue of the Prehistoric Antiquities (*Chamberlain*) 757
WOOD: The Symphony of Life (*McGee*) 759
MALER: Researches in the Central Portion of the Usumatsintla Valley (*Thomas*) 759

NOTES AND NEWS

Archeological Survey of Michigan, 198. Twined weaving, 201, 202. Artifacts from Norse ruins, 202. "The Skeleton in Armor"; was it Norse or Indian? 204. Death of Colonel Hilder, 205. Jipijapa or Panama hats, 206. Twine-making without apparatus, 207. Study of Romance languages and literature, 207. Death of Miles Rock, 208. Conscious word-making by the Hupa, 208. Cushing's "Zuñi Folk-Tales," 209. Eskimo stone implements, 209. Minor notes, 210. A Maine Indian ceremony in 1605, 387. Skeleton in armor, 388. Robert Grant Haliburton, 389. An Algonquian loan-word in Kiowa, 390. Eskimo and Samoan "killers," 391. Ollivier Beauregard, 391. Minor notes, 392. Anthropology at the University of California, 582. The savage progressive and the savage stationary, 583. Egyptian mummification, 584. Apache and Navaho fire-making, 585. Andrew Ellicott Douglass, 586. Etymology of "caribou," 587. The African Society, 588. Poisoned arrows for blowguns, 589. A new archeological publication, 589. Dr Walter Hough's researches, 590. Phillips Academy, 590. Dr L. Serrurier, 591. Anthropological Society of Paris, 591. Father William Pope 591. Dr León's studies, 592. Dr Joshua Miller, 592. Preservation of caverns and prehistoric stations, 592. Hollowing pipe-stems, 592. Minor notes, 593. Anthropological lectures in German, Austrian, and Swiss universities, 791. International Congress of Americanists, 792. Philippine hats, 793. Lectures at the École d'Anthropologie, Paris, 793. Dr Fewkes' researches, 794. Minor notes, 794.

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MAN'S PLACE IN NATURE[1]

BY W J McGEE

In the opening paragraphs of his most memorable contribution to knowledge (*Man's Place in Nature*, 1863) Huxley made mention of certain similarities between the activities of anthropoids and those of men; and while the burden of the work was devoted to structural homologies, the initial keynote was retouched here and there throughout the discussion. Huxley's classic contribution to anthropology needs no encomium; it was a pioneer's milemark of progress, erected under difficulties; and it suffices that all later travelers have found it in the direct way of experiential truth. Yet it is worth while now and then to take stock of advances subsequent to, and largely consequent on, the Huxleian declaration.

Since Huxley's pioneer work, a host of investigators have carried forward the study of structural homologies connecting the genus *Homo* with lower genera and orders; and today the physical similarities are among the commonplaces of knowledge, whatsoever the background of philosophical opinion concerning cause and sequence. During the last decade or two the investigators themselves, with scarce an exception, have gone one step further, and now include sequence of development from lower to higher forms as among the commonplaces of opinion, whatsoever the background of metaphysical notion as to cause. There the strictly biologic aspect of the question as to man's place in nature may safely be considered to rest; there has been little advance in opinion beyond that of the pioneer in 1863; but the data have been multiplied, and the knowledge and opinion have been diffused widely.

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[1] Address of the retiring President of the Anthropological Society of Washington, delivered before the Washington Academy of Sciences and Affiliated Societies, February 26, 1901.

Since Huxley's epoch-marking memoir was first published, occasional contributions have been made to knowledge of the activities displayed by various sub-human animals, and during the last quarter of the nineteenth century a science (which has been called the New Ethnology) has been organized to deal with the activities of mankind; yet singularly little has been done in the way of tracing activital homologies between the genus *Homo* and lower genera. It is indeed conventional for sociologists, and customary for comprehensive writers on anthropology, to instance the social habits of mammals and birds, and even of insects and infusoria, as analogous to human society; one naturalist has gone so far as to study various mammals and birds in their activital aspects, thereby opening a most attractive field in science as well as in literature; but no investigators have turned seriously toward the habitual activities displayed by the anthropoids — still less have comparative studies been made of the activities normal to both the higher quadrumana and the lower races of mankind, albeit this is perhaps the most inviting field now open to research. Thus far this line of inquiry grovels in the stage of travelers' tales; the gorilla-hunter tells how the family sire sleeps at the foot of a tree in which mother and young are nested, the naturalist in Liberia incidentally describes the use by monkeys of stick and stone implements, while the Bornean tourist tells of the simian servant who prefers the society of human masters to that of his kin and discriminates among the garments he is permitted to wear; but there is a woful dearth of critical observation and a lamentable lack of judicious generalization pertaining to this promising meeting-ground of zoölogy and anthropology. So this aspect, too, of the great question concerning man's place in nature remains nearly as it was left by Huxley; the data are more abundant, and opinion has been both clarified and diffused; yet definite homologies remain practically unfound, if not unsought, and the scattered facts have thrown little light on cause, less on sequence.

Since Huxley's prime, the New Ethnology has arisen; and it has opened a vista of facts and relations which apparently escaped the keen vision of the pioneer in 1863 — the vista embracing thought, with all the other psychic factors pertaining to the activities, sub-human as well as human. This vista is perhaps the broadest and most attractive ever opened by science: When Galileo descried the harmonious paths of the planets in a sun-centered system, he raised the minds of men to a new plane; when Newton grasped the idea of gravitation, he gave human thought a new hold on nature; when Darwin discerned the lines of specific development, he wrought a revolution in the world of intellect; but when students still living scanned the lines of activital development and realized that thought itself is bred by the very activities over which it comes later to hold dominion, they opened a new intellectual world — a world at once so novel and so commanding that some of the students themselves are fain to sit at the gate and view the prospect as fleeting phantasm rather than veritable reality. Nor is their hesitation either unprecedented or unpardonable: When the biologists of only one long generation ago unrolled the scroll picturing the origin and perpetuation of species through natural interactions, their interpretation seemed too simple to be true; when the anthropologists of the present generation unrolled a similar scroll picturing the origin of activities (arts, industries, laws, languages, doctrines) through natural interactions and self-developed interrelations — and in this way alone—, their interpretation in turn seemed too simple to be true; and when the anthropologists of the old century's end (and of this Society) unroll a scroll picturing the origin and development of thought itself through the long chain of interactions between the thinking organism and external nature — and in this way alone—, they foresee that their interpretation must seem too simple to be true — though they find comfort in the teachings of experience that in the long run simple explanations are preferred, that simple doctrines at last prevail, indeed that the progress of knowledge is best measured by its own simplification. But even after full allowance for hesitation and doubt, it must still be said that the opening of the post-Huxleian vista has had much effect: It has widened the view of nature to include the psychical as well as the physical aspects of organisms; it has correspondingly narrowed the range of extra-natural explanations of phenomena; and, specifically, it has revealed a new class of homologies among the races of men and between these and sub-human organisms. So the homologies recognized today as defining man's place in nature are of three classes: (1) structural, as wrought out by Huxley; (2) activital, as suggested by Huxley and wrought out by Powell; and (3) mental, or psychic. Expressed otherwise, man's place in nature is now defined, first by what mankind and their kindred *are*, second by what they *do*, and third by what they *think*. And the chief progress of the post-Huxleian epoch, albeit practically confined to *Homo sapiens* in various grades of development, has followed the lines of psychic homologies.

It is just to say that the foundation for modern knowledge of psychic homologies was laid by Tylor in his *Primitive Culture* (1871), and especially in the seven notable chapters on animism elaborated in successive editions; for he showed that a certain type of philosophy is of world-wide extent and is, or has been, shared by every race, every known people, whatsoever their diversities of color or condition. This foundation was gradually raised into a definite platform, partly by Tylor in later publications, partly by Powell in brief memoirs on *The Mythology of the North American Indians* (1879) and *Activital Similarities* (1881), in which it was shown that the interactions between distinct peoples and similar environments frequently produce similar activities, howsoever diverse the peoples themselves; and important additions to the platform were made by Brinton in various contributions summarized in his *Religions of Primitive Peoples* (1897), in which he showed that the human mind, even in its more complex operations, reflects environment with striking fidelity. True (as recently shown by Boas [1]), the products of interaction between peoples and environments are in some measure inconsistent, and may even at first sight seem contradictory; but, as pointed out on a previous occasion,[2] the incongruities shrink or disappear when the comparisons are confined to peoples in corresponding degrees of cultural development.

The modern platform for the study of psychic homologies may be defined briefly in terms of a few generalizations, which seem to be consistent with the sum of knowledge concerning the psychic attributes of both human and sub-human organisms, viz: (1) the mentality of animals is instinctive rather than ratiocinative, and for each species responds practically alike to like stimuli; (2) the savage mind is shaped largely by instinct, and responds nearly alike to like stimuli; (3) all barbaric minds are measurably similar in their responses to environmental stimuli; (4) civilized minds rise well above instinct, and work in fairly similar ways under like stimuli; and (5) enlightened minds are essentially ratiocinative, largely independent of instinct, and less nearly alike in their responses to external stimuli than those of lower culture. The several generalizations are mutually and significantly harmonious; they combine to outline a course of development beginning in the animal realm with organisms adapted to environment through physiologic processes, and ending in that realm of enlightened humanity in which mind molds environment through nature-conquest [1]; and they measure the gradual mergence of bestial instinct in the brightening intellect of progressive humanity. To, or at least toward, this platform those working anthropologists concerned with the broader aspects of the science have been pressed by accumulating observations and generalizations; yet the platform owes much of its character and most of its strength to the concurrent development of a scientific psychology at the hands of a notable group of experimentalists in psychic phenomena. The several generalizations embodied in the platform have already been summarized as the latest and most comprehensive among the principles of science, i. e., the responsivity of mind [2]; and by aid of this principle, psychic homologies may be traced between higher culture-grades and lower, and from people to people and tribe to tribe down to the plane of lowest savagery — where the lines cease for lack of data, leaving the lowly mind in a state even more suggestively akin to that of the sub-human organism than is the lowest human skeleton to that of the highest anthropoids.

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[1] "The Mind of Primitive Man," *Science*, vol. XIII, 1901, pp. 281–289.

[2] "Cardinal Principles of Science," *Proceedings of the Washington Academy of Sciences*, vol. II, 1900, p. 11.

Especially within the last decade of the old century, anthropologists have come to recognize a course of development of the esthetic arts — a sort of natural history of esthetics, arising in symbolism, running through conventionism, and maturing in a degree of refined realism found satisfying by civilized and enlightened peoples. Now a significant feature of this development is found in the fact that the initial symbolism is zoic or animistic, putatively if not patently: The esthetic hunger of primitive artists is sated by the carving of totems on trees or rocks, by the molding of animal effigies, perhaps by the delineation and painting of zoic pictographs; as the artists rise in the scale of culture, the zoic designs are partly conventionized (eventually passing into arbitrary alphabets), partly perpetuated in more realistic forms still conceived as fraught with mystical meaning, like the asp of Egyptian sculpture, the dragon of oriental painting, the curiously vestigial unicorn of a modern nation's coat-of-arms, and even the eagles of other national insignia. So, also, when primal man first yields to the charm of music, his songs and accompaniments mimic the rhythmic footfalls of feared or venerated animals, the rustling sounds of animal movements, the inchoate melody of animal voices; when he enters the demesne of drama, his characters are beasts or uncanny monsters tricked out in zoic trappings; and it is only after long stages of development that anthropomorphic motives are introduced, and that the music and drama rise to the plane of realistic representation. In some cases, if not commonly, the germ of esthetic development quickens in painting of face or body, to grow into tattooing; in simplest form the painted devices may serve as beacon-marks for the identification of kindred (like the face-marks of various animals), as among Seri matrons,[1] or may symbolize fearsome animals, as among Sioux warriors; but in every well-known case the motive is symbolic expression of zoic attributes. From these germinal efforts of esthetic faculty to that modern stage of art in which the noblest realism and the highest idealism are wedded, the way is long; but every step is marked by the dropping of zoic motives and the substitution of motives springing from human attributes and aspirations.

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[1] Cf. "The Seri Indians," *Seventeenth Annual Report of the Bureau of American Ethnology*, 1898, p. 269.

[2] "The cardinal principles of science may be reckoned as five : the indestructibility of matter, the contribution chiefly of Chemistry ; the persistence of motion, the gift mainly of Physics ; the development of species, the offering of the biotic sciences ; the uniformity of nature, the guerdon of Geology and the older sciences ; and the responsivity of mind, the joint gift of several sciences, though put in final form by Anthropology."—*Proceedings of the Washington Academy of Sciences*, vol. II, 1900, pp. 11–12.

Within a few years working anthropologists have come to recognize more or less clearly a natural history of industries, comparable with that of arts — a course of development also arising in symbolism, running through instinct-guided conventionism, and maturing in that sublimest product of mentality, invention. It has long been known that barbaric artisans seek omens among birds, borrow lore from beasts, and run to zoic motives in decoration[1]; it has long been known, too, that savage huntsmen not only imitate the movements of feral animals in the chase and seek to incite their weapons and strengthen their arms by zoic trophies, but even mimic the feral carnivores' blood-craze in fierce berserker rage at times of battle; and more recently it has been noted that the most primitive implements are of tooth, claw, shell, and bone, selected and used as emblems of zoic power. In a typical tribe — the Seri, most primitive of known Amerinds — the pristine implement is a sea-lion tooth, differentiated into arrow, harpoon, and firestick; the teeth themselves are classed as stones, and natural pebbles are used for tools emblematic of the zoic organs; while the methods of chase and warfare still mimic the habits of local beasts. The lines of human progress from primal savagery to enlightenment may be traced in terms of development of each or all of the great groups of activities; and while all the tracings conform so closely as to inspire confidence in each, no outline is more definite than that represented by the stages of industrial progress — stages best defined in terms of the mind-led activities of which artifacts are normal products. These stages (beginning with that typified by the Seri) are (1) Zoömimic, in which bestial organs are used as arrows and other implements, to which magical powers are imputed by dominating zoötheistic faith; (2) Protolithic, in which naturally-formed stones are used for cleavers and other implements, under the sway of mystical faith modified by experience of mechanical chance; (3) Technolithic, in which design-shaped stones are used for knives and other implements in ways revealing the germ of invention; and (4) Metallurgic, in which ores are smelted and used for tools under the influence of invention.[1] Whether the progress be traced through these stages or otherwise, the way from the simple industries of the prime to the elaborate devices of modernity is long, very long; yet a full half of the steps are marked by the dropping of zoic motives and the substitution of motives expressing man's growing consciousness of power in nature-conquest.

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[1] The sematic and telic functions of face-painting are discussed in "The Seri Indians," op. cit., p. 167 et seq.

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[1] Even the faith-guided anti-zoic motive of arabesque decoration attests the force of the zoic tendency and the effort required to divert it.

Since Tylor traced primitive culture, and especially since Morgan wrote on *Ancient Society* (1877), it has been recognized that all known primitive peoples are banded in consanguineal groups, while advanced peoples are bound in larger groups by laws defining proprietary and personal rights; and during the last decade or two working anthropologists have come to recognize the course of development of social organization in its several stages — i. e., the natural history of laws. Now it is significant that the most primitive social bond (found alike in America, Africa, Australia, and parts of Asia) is that fixed by the ocular blood-kinship of maternity, and that the next great stage is defined by paternal relationship; for in both stages the lines seem to be homologous with the instinctive habits of sub-human species, while the earlier the more closely approaches the low plane of brute knowledge — so far as this can be inferred from brute conduct. The researches among the aborigines of America have thrown strong light on the lowly laws of primitive peoples; for it has been ascertained that both savage clans and barbaric gentes are bound not merely by community of blood but welded into homogeneous units by community of faith in zoic tutelaries — faith so profound, so blent with fear and hope, so impressed by recurrent ceremony from birth to maturity and thence to old age and death, as to dominate every thought and regulate every action. The Amerind tribesmen are grouped by totems (or tutelaries) of Wolf, Badger, Bear, Fox, Deer, Coyote, Eagle, Bluejay, etc.; they call themselves Wolves, or Badgers, or Bears, or Eagles, and glory in the strength and magical prestige believed to be brought them by their genii; most of them recite traditions of descent from the tutelary animals, or else from fantastic monsters invested with their attributes; and every adequately studied tribe has been found to possess a traditional genesis or sacred cosmogony in which the tutelaries, and perhaps other beasts, are glorified if not deified. The exoteric bond of clan or gens is blood-kinship; but the union is reinforced by an incomparably stronger esoteric bond of animistic belief. The way from beast-clanship to free citizenship is long — so long as to afford the most striking measure of human progress; yet every step of the way is marked by the elimination of zoic concepts and by the substitution of humane concepts forced on the genus *Homo* in his ceaseless strife for nature-conquest.

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[1] The stages and transitional sub-stages are set forth in greater detail in "The Seri Indians," op. cit., pp. 249–254.

During some decades past, students of aboriginal tongues have been impressed by the failure of primitive folk to discriminate clearly between men and animals in their everyday speech; and this lowly habit forms one of the phenomena which have served (as recently shown by Powell)[1] as a clue to the natural history of languages. Many Amerind tribes denote themselves by a term connoting animals, either in general or of a particular class, and when pressed to specify are compelled to employ an affix or adjective to distinguish the human kind (often considered inferior) from the rest; some, like the Papago, trace human genealogy through only a few generations forward or backward, and conceive the lines as beginning and ending in an undifferentiated magma of zoic life designated by a single term; while some groups have progressed so far in the way of human superiority as to dignify themselves by the expressions "Real Men," "True Men," etc., in contradistinction from alien tribes and other contemptible creatures. The scroll picturing the development of language is expanded about midlength by the addition of the scriptorial branch, representing the growth of graphic expression; and it is quite in accord with the growth-lines of oral expression to find that the earliest essays in ideography are pictures of zoic objects, or objects to which zoic attributes were manifestly imputed. Most of the primal features of modern alphabets have been conventionized beyond recognition; but the hieroglyphs of Mexico and Egypt and the ideographs of China are among the clearer vestiges of primitive standards, while the fancy-wrought constellations of the celestial sphere—birth-mates of pre-Cadmean characters remaining unchanged by reason of remoteness from practical affairs—still conserve the graphic zoölatry in which writing began. The way from lowly language linking men and beasts in word and sign to a discrete graphic vocabulary is long; yet the earlier steps were unquestionably marked by the dropping of instincts shared by brutes and the substitution of humanitarian concepts impressed by ever-widening human associations.

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[1] "Philology, or the Science of Activities Designed for Expression," *American Anthropologist*, vol. II, 1900, pp. 603-637.

Since Tylor taught the world-wide range of animism in 1871, anthropologists have grouped the myths and faiths of mankind in a series of stages outlining a course of development — a natural history of doctrine — coming up through a slavish and despairing hylozoism, and ascending thence through higher zoötheism and broadening worship of nature-powers on successive planes, each brighter and more humane than the last. The zoic factors of primitive arts, industries, laws, and languages were manifestly made potent in the olden time, as they are today among lowly folk, alike by overweening faith and ever-present custom; they were, and still are, kept alive not only by recurrent ceremony and daily taboo and hourly precept, but by tireless study of animal contemporaries whose habits huntsmen must know under pain of hunger; so that much (perhaps most) of the sentient feeling of primal man must have been — as it is today among his survivors — of animal contemporaries. In savage life men and their animal associates are compelled to consecrate their best efforts to study of each other; in affairs of feeling and faith as in matters of immediate utility, the association engenders habits of body maturing in instincts eventually ripening into action-shaping habits of mind; and the stronger mentality is naturally the more deeply influenced — until continued experience of superior faculty awakens consciousness of superior power, stirs the sleeping giant of self-confidence, and rends the shackles of zoöphobia forever.

> Lo, the poor Indian! whose untutored mind
> Sees *Beasts* in clouds, or hears *them* in the wind;

so a modern Pope would write of the American natives; and so, too, he might write of any and all other aborigines made known through the researches of the last half-century. The upward way from primal beast-faith through concurrent fetichism and shamanism and thence through mysticism and all manner of occultism is long and need not now be traced; it suffices that all of the earlier and many of the later steps were marked by the dropping of zoic motives or vestiges and the substitution of ever nobler motives and imageries.

When the scrolls picturing activital development are brought together—when the natural history of doctrines is outlined over those of languages, laws, industries, and arts—the leading lines are found consistent in every essential feature; and all are seen to rise from a mentality both reflecting and approaching that of lower animals (though just how closely may not be measured until the sub-human mind is better understood) toward the highest human plane revealed in science and statecraft. The savage Seri—lowest of American tribesmen—is loathed by Caucasian neighbors as an uncanny beast, and it is a revelation to find that he reciprocates the loathing and glories in the contumely, feeling that it allies him the more closely with venerated consociates like puma and shark, and divides him the more widely from the hated white creatures of unnatural ways; and the sentiment of the Seri is measurably common to all aborigines of strong individuality. The impressive fact, learned alike through observation of a typical tribe and through analysis of the mental operations of primitive peoples in general, is that the savage stands strikingly close to sub-human species in every aspect of mentality as well as in bodily habits and bodily structure.

Since Huxley's prime, the chief advances in anthropology have related to what men *do* and what men *think;* and the progress has been such as to indicate with fairly satisfactory clearness the natural history of human thinking as well as that of human doing. Thereby man's place in nature may be defined more trenchantly than was possible in 1871: (1) As shown by Huxley, the structure of *Homo sapiens* is homologous with that of lower orders, while the morphologic differences between highest anthropoids and lowest men are less than those separating lowest men from highest men; (2) as suggested by Huxley and established by later researches, the activities of *Homo sapiens* are homologous with those of the anthropoids, while the activital range between club-using gorilla and tooth-using savage is far narrower than that separating the zoömimic savage from the engine-using inventor; (3) as shown by the latest researches, the mental workings of *Homo sapiens* are homologous with those of lower animals, while the range from the instinct and budding reason of higher animals to the thinking of lowest man seems far less than that separating the beast-fearing savage from the scientist or statesman. The resemblances and differences in doing and thinking may not yet be measured in definite units, as are cranial capacities and facial angles (though the recent progress in experimental psychology gives promise of quantitative determinations of general sort at no distant day); yet the relations are hardly less clear and tangible than those customarily measured in inches and ounces and degrees.

So in the light of the latest researches man must be placed wholly within the domain of nature, yet above all other organisms at heights varying widely with that highest product and expression of nature, mental power.

CERTAIN GAMBLING GAMES OF THE KLAMATH INDIANS

By GEORGE A. DORSEY

During the month of June, 1900, it was my good fortune to spend a week among the Klamath Indians of Upper Klamath lake, Oregon, the object of my visit being to obtain ethnological collections for the Department of Anthropology of the Field Columbian Museum. In this I succeeded far beyond expectations, for, although the Klamath are reached only after a long and tiresome stage journey of 120 miles, and hence are rather free from the visits of collectors, they early in their association with the Indian Bureau willingly and even eagerly decided to adopt the manners and customs of the white man, consequently, to a very large extent and from many points of view, they have ceased to be a subject of general interest to the anthropologist. But so tenacious a hold has the primitive life upon the Indian that there still survives much that is of value and real importance to the student. Naturally I had access to Gatschet's scholarly work on the language of the Klamath,[1] and in many ways it proved of great assistance; but the importance of making a full and complete ethnologic collection in connection with a work of this nature was many times proved, for of the 250-odd specimens which I collected not more than three-fourths are mentioned in Gatschet's dictionary.

Among the categories of objects collected by me among the Klamath, none is more complete or interesting than that of games, of which not fewer than ten varieties were procured. With most of these satisfactory data were gathered; with one or

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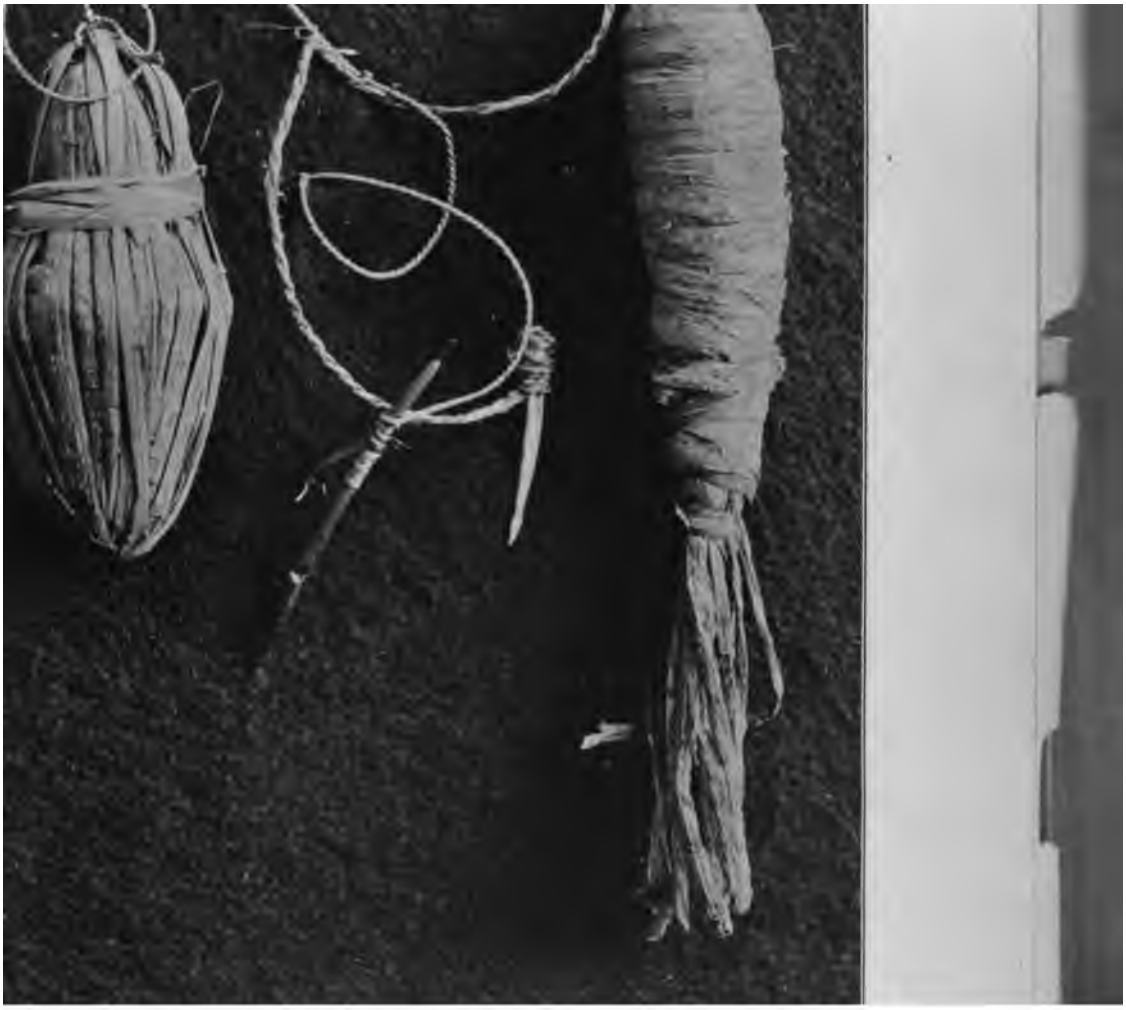
[1] A. S. Gatschet: "The Klamath Indians of Southwestern Oregon"; *Contributions to North American Ethnology*, vol. II, Washington, 1890.



two I had difficulty in obtaining such information as was desired, but this must be attributed to the nature and briefness of my visit. Not so much on account of the number of games collected as on account of the very peculiar geographical position of the Klamath have I thought a brief account of these games to be of sufficient importance to merit publication. The almost unique geographic position of the Klamath may best be comprehended by a glance at Powell's Map of the Linguistic Stocks of North America.[1] This map shows them to be near neighbors of not fewer than twelve different stocks, among which may be noted families of such importance as the Shoshonean, Shahaptian, and Athapascan. With such neighbors, so diversified in their origin and culture, it will be more than surprising if we do not find the Klamath games full of interest; and above all we may reasonably expect a wide variety of forms, for it seems probable that no phase of American aboriginal life was so subject to adoption by other tribes as gaming devices.

In considering the order in which the Klamath games should be treated, I have thought it better to follow a classification based on the character or nature of the games themselves than to treat first of the games played by the men, following with those of the women. It is now a well-known fact that, owing chiefly to the investigations of Mr Culin, the sixty or more varieties of games found in North America may be resolved into not more than five general divisions, the games in each being more or less intimately related and all perhaps having had a common origin.

I. As an example of the first category, the Arapaho wheel-and-arrow game may be cited. In this class of games a spear is hurled or an arrow is shot at something, generally a ring. Success in these games depends primarily on the ability to shoot or hurl a missile so that it may strike in some particular spot or that it will come to a full stop at some point in contact with a special portion of the ring.

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[1] *Seventh Annual Report* of the Bureau of Ethnology.

II. Somewhat similar to games of the first division, those of the second also require the ability of the player to take good aim, but the object in this case is directly struck, as a ball by means of a stick. Strength and (to a greater extent) agility are also required, for the ball must be driven to a certain point in opposition to the efforts of an opponent, or certain positions of the ball must be maintained for a length of time greater than is possible with the adversary. Such are the game of shinny, so common among the Plains Indians, and the game of football or kicked stick among the Pueblo tribes.

III. In the third category of games success depends rather on skill acquired by long and patient practice, the object being to catch some such object as a cup-shaped bone, or a fish vertebra, or a ball, upon the point of a bodkin or needle. The so-called matrimonial game of the central and eastern Indians is the best-known example.

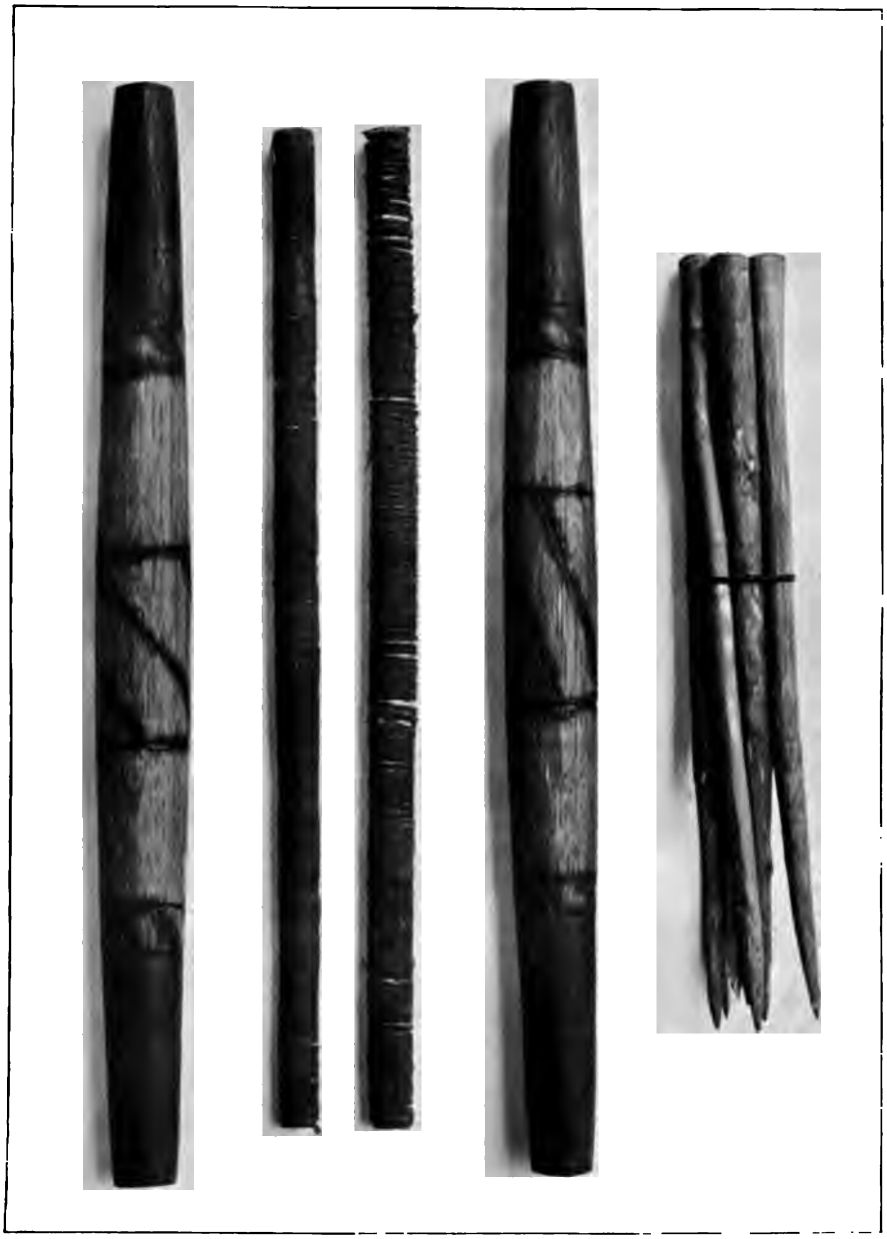
IV. In this category success is dependent solely on judgment, the object being to guess the location of an object, or of one object from two or more which have been concealed. Good examples are the moccasin game and the hand or grass game.

V. In the fifth class of games, objects are thrown on the ground or are permitted to fall in a basket or bowl, and the count is determined by the chance of the throw, one side or the other of the objects having a certain value, either singly or in combinations; such are the well-known stave and dice games.

The order in which these five categories of games has been given is based merely on the personal convenience of the writer. That this order suggests any line of development is not believed; on the contrary, it is extremely likely that the games of the second division represent the oldest of American games.

I.—RING AND JAVELIN GAMES

The games of this class, nine specimens of which were collected, represent five distinct variations.



KLAMATH FOUR-STICK GAME AND COUNTERS

(Cat. No. 61537, Field Columbian Museum. Three-fourths natural size)

WÓSHAKANK.—This is a ring-and-arrow game, the arrows employed not differing from those used by boys in hunting. The ring (61682)[1] measures 11 inches in diameter and is made of the inner fiber of the tule rush, wrapped with tule bark. The object of the game is to hit the ring with an arrow.

Another specimen of ring (61681) belonging to this game is 6 inches in diameter. Rings of this size are used chiefly by boys. In construction it does not differ from the ring just described, except that half of the outer wrapping is of tule.

SHŬ'KSHUKS.—This game is generally similar to the one just described. It is usually played in a wikiup by either men or boys, and most commonly in winter, in the following manner: One of two boys, sitting from eight to ten feet apart, rolls a ring toward the other who shoots at it with an arrow (*ntĕ'kish*). In case he hits the ring, the one who rolled it endeavors, by shooting, to dislodge the arrow therefrom. Should the latter succeed, there is no count; otherwise the one who first shot gains an arrow, the object of the game being to win arrows. In the set collected (61641), there are a small bow, 2 feet in length, and three small reed arrows with long sharp wooden points of sage. The rings belonging to the set measure 3 and 4 inches in diameter, respectively, and are made of a variety of flexible bast.

Another ring (61530) belonging to this game measures 4 inches in diameter; it is made of tule fiber loosely wrapped with straw-like rush.

SHŬ'KSHUKS.—Although this game bears the same name as the one last described, the manner of playing is somewhat different. The ring (*shŭ'kshuks*) measures half an inch in diameter (figure 1), is rather tightly woven, and is not so flexible as the rings above described. Instead of an arrow, a small awl-like object is used, consisting of a bone point mounted in a sharp wooden handle. This variety of the ring game is played by both sexes and by all ages, and generally in the wikiup. The players sit facing each other, and as one rolls the ring in front of him his opponent attempts to pierce one or both sides of the ring with the point of his awl. To pierce one side counts one, both sides two. Two specimens (61716–17) of this game were collected.

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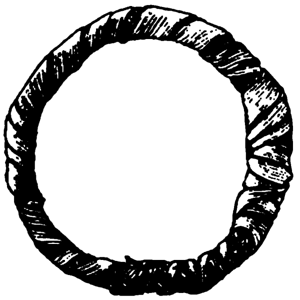
[1] Numbers refer to specimens in the Field Columbian Museum.



SHŬ'KSHUKS.—This is an interesting variation of the ring game for which I could get no native name to distinguish it from the ones just described; nor do I know that an account of this game has ever been published. The ring (figure 2) measures 11 inches in diameter and is an inch thick. Across one side of it is fastened a cross-bar, measuring 17 inches in length, projecting three inches beyond the ring on each side. Both ring and cross-bar are made of the inner fiber of the tule rush, closely wrapped with tule bark, the inner surface being placed outside, giving the ring a whitish color. In playing the game two rings of equal size are used; these are placed in an upright position, one end of the cross-bar resting on a sharp wooden pin firmly fixed in the ground. The interval between the two goals varies according to agreement between the players. There are always two opposing sides, each

FIG. 1—Ring and awl for game. (Cat. No. *61717*, Field Columbian Museum. Natural size.)

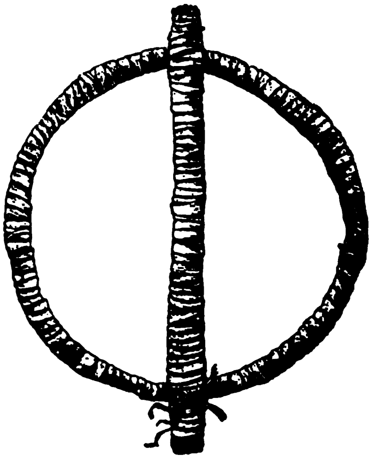


FIG. 2—Tule fiber ring for game. (Cat. No. *61674*, Field Columbian Museum. ⅛ natural size.)

consisting of one or more individuals. The ring is shot at with arrows from a bow, the object being to pierce both sides of the goal, which is always placed at right angles. Two specimens (61622, 61674) of this game were collected, the only difference being in the size of the diameter of the ring and the length of the cross-bar. This game, I was informed, has not been played for many years, and satisfactory information concerning the method of playing could not be obtained.

SHÍKNA.—This interesting variation of the ring game is played only by men. It consists of as many spears (*shíkna*) as there are individual players, and two goals (*tchedalk*), each of which is simply a forked stick thrust into the ground at such interval as may be mutually agreed on. The spears are of willow, measuring 6 feet in length and sharpened at one end. They are decorticated, except at the lower extremity. The spears are hurled from the hand, the object being to cause them to fall in such manner that the end of the spear will rest on the fork of the goal. Such a throw counts five, otherwise the one whose spear falls nearest the goal counts one; ten usually constitutes the game. The game is still practised to some extent by the Klamath, and in playing they exhibit great skill, one of the players whom I saw not failing to strike the goal oftener than once in six or eight throws. One set of this game (61710) consists of two spears and a pair of forked sticks.

II.—BALL GAMES

Of games of this variety two sets were collected, one of which is not without considerable interest:

TCHÍMMAASH.—This game (61538) is generally played by women. Two goals (*ánku*) are marked about a hundred yards apart. Each player is armed with a short willow pole (*skuékûsh*) with which she attempts to drive before her, in the direction of her opponent's goal, two wooden billets, 6 inches long and an inch in diameter, fastened to each other by means of a stout cord, 10 inches in length, which passes through the center of each billet (figure 3). From two to ten generally play. The set of two poles (61538) collected by me are of willow; they are decorticated and marked throughout the greater part of their length with two burnt spiral bands which run in opposite directions. This game has been described by Gatschet[1] as follows:

> In playing *tchímmaash*, the Klamath women run back and forth, every one holding willow poles. In the middle of the starting places on either side they plant sticks for fixing bases, then with their poles they throw up the game string. Having caught it they throw it to the others, then they run over there; they throw the game string while chasing each other. One party throws back the poles to the girls on their side; and they then chase each other to the bases.

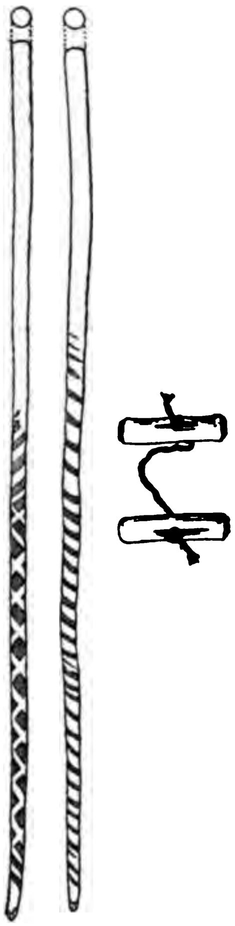


FIG. 3—Poles and double ball for game. (Cat. No. *61538*. 1/16 natural size.)

SHINNY.—For some reason, which I can not now explain, I failed to get the Indian name of this game. The set collected (61726) consists of a bat of white pine terminating in a flat extended portion, and a ball 2½ inches in length, of the same material. There is nothing in the Klamath method of playing this game which calls for special comment.

HESHTALXEASH.—The invariable answer to repeated inquiries among the old men was to the effect that the Klamath possessed tops before the advent of the whites. The first specimen (61729) has a disk, 2½ inches in diameter, made of white-pine bark, through which is thrust a 4-inch stick sharpened at each end, thus giving the form of an ordinary spinning top.

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[1] Gatschet, loc. cit., part I, p. 80. This and following quotations from Gatschet are literal translations of native texts.

The second specimen collected (61728) is similar to the first except that the disk is of cedar bark and instead of being beveled at the edges is cut off squarely.

III.—BALL AND PIN GAMES (PLATE II)

A number of specimens of a single variety of a game of this category which were collected are unusually interesting and, so far as I know, have not previously been noted as existing in this region.

SOQUOQUAS.—This specimen (61531) consists of a long elliptical ball made of tule pith. The lower end of the ball, which remains loose, consists of a dozen or more strings of tule fiber which project beyond the ball. The upper portion or body of the ball is tightly wrapped with the outer bark of the tule rush. Projecting from the upper end of the ball is a small braided loop, a quarter of an inch in diameter, to which is fastened a 6-inch thread of native grass. At the end of this thread is attached a small bone pin a little more than an inch in length. The game is played as follows: Taking the pin by the end to which the cord is attached between the thumb and forefinger, and permitting the ball to hang loosely at the end of the string, a sudden downward thrust is given, the object being to strike the braided loop and catch it on the point of the pin. This is known as *shapashspatcha* ("to split or punch out the moon"). The game is always played in winter and generally only by adults. It is believed that by "punching out the moon" in this fashion the winter months are shortened and the advent of spring is hastened.

Another example (61673) is made similarly to the specimen just described; the ball, however, is 5 inches in length, while from it project several strands of the inner fiber of tule, also 5 inches in length; the knot, string, and pin are somewhat larger.

In another specimen (61532) no strands of fiber project from the ball, the two ends being similarly finished. Instead of the string being tied in a loop at the upper end, it is simply and an inch at the center, and the extremities have been blackened by being charred with a hot iron. Toward the center of these two sticks are two bands, two inches apart, which have been burnt in. Connecting the two bands are four parallel spirals also made by burning. There are also six small sticks, 8 inches in length, sharpened at one end and painted red; these are counters (*kshesh*) which, at the beginning of the game, are in possession of one or the other side and lie flat on the ground. As points are won by one or the other side, they are taken up and thrust into the ground in front of the winner according to the number of points gained. In playing this game the four long sticks are arranged in one of a number of possible combinations, the player hiding them under a blanket or large basket tray. *A* taking the counters on his side makes the first guess, *B* manipulating the sticks under a blanket or mat. Should *A* guess correctly the position of the sticks, he wins and thrusts in the ground one or two counters according to the value of his guess, and *B* again arranges the sticks under the blanket. Should *A* guess wrongly he forfeits one counter and guesses again, but in this case *B* conceals only two of the sticks, that is, one large and one small wrapped one. If *A* wins, or guesses correctly, the sticks are passed to him, when he manipulates them under the blanket and *B* guesses. But if *A* loses, he forfeits a counter and *B* again manipulates the single pair of sticks. In guessing, when they wish to designate the small wrapped sticks, the index and middle fingers are used; for the thick sticks, the index finger alone. In expressing the guess at positions numbered 1 (figure 6) and 2 (*vuish*) they

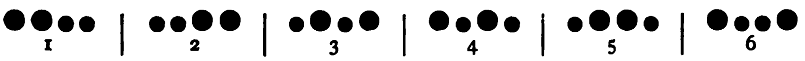

Fig. 6—Possible combinations of large and small sticks.

move the hand sideways one way or another as they desire to indicate the positions as expressed in numbers 1 or 2. To miss the guess when "*vuish* is laid" neither side loses nor wins, nor is there any changing to the other opponent of the sticks; but when the position 3 or 4 is laid, with *A* guessing and winning, the sticks must be passed to him for manipulation and he wins no counters. When the sticks are laid in position 5 or 6 and *A* guesses, using two fingers, he obviously loses doubly and two counters are passed to *B*.

Another set (61724) of this game which was collected is exactly similar to the one just described, except that the buckskin-wrapped sticks are not painted black, while the two large sticks are not painted alike, one having two burnt bands about the center two inches apart, from each side of which a row of zigzag lines extends entirely about the stick. On both of the large sticks of this set there are four parallel bands, equidistant from the burnt ends of the stick, the two pairs being connected by parallel spirals.

A third set (61723) collected has two small sticks wrapped with rawhide which has been painted red; the large sticks are charred at each end for an extent of about an inch, while in the center are two parallel black bands. The intervening portions of these two sticks are painted red. This game has been described by Gatschet[1] as follows:

> They play the stick game with four sticks; there are two thick, also two slender skin covered sticks. They guess at the slender sticks with index and middle finger, at the thick ones however with the index finger; they guess at the *vuish* moving the hand sideways; they also guess with the thumb making a side move. By the *vuish* they can only win one counting stick; with the index and middle finger they win two counting sticks, having put forward the index finger. When they have won all stakes from the losers then they stop.

V.—STAVE AND DICE GAMES

In this category of games two well-known varieties were collected, the stave game and the woodchuck-teeth dice.

SKUSHASH.—One set (61711) of this game which was collected

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[1] Gatschet, loc. cit., p. 79.

LABORATORY OUTLINES FOR USE IN AN INTRODUCTORY COURSE IN SOMATOLOGY

By FRANK RUSSELL

At Harvard University two classes of students take courses in Somatology: those who are preparing for the profession of medicine and those who are fitting for professional work in Anthropology. The choice of the former is sanctioned by Topinard in these words: "The knowledge of Anthropology adds to medicine a certain superiority, it adds interest to the study of anatomy and physiology; it is the crown of the school of life." The other class acquire knowledge that is essential, in my opinion, to the anthropologist, whatever special division of the science he may enter.

These outlines are published in the hope that they may prove useful to students of Somatology who have not had, heretofore, such a guide. The prominence given to osteology is due in part to the limitations of a recently established laboratory and in part to the abundance of such material at hand. It is to be understood that other sections of the science of Somatology are presented in this general introductory course by means of lectures illustrated by charts, etc.

OSTEOLOGY

A.—Racial and Sexual Type

Study the series of Caucasian and Amerindian bones to determine the average size and form for each of the two races. Compare with the skeletons of other races as far as possible.

Determine the mean for each SEX separately and compare one with another. If DISEASED BONES are found, study their condition: osteoporosis, exostosis, ostitis.

In the study of PAIRED BONES compare right with left.

THE APPENDICULAR SKELETON

a. CLAVICLE:

Measure its length[1]; identify the deltoid tubercle; trapezoid line; subclavian groove; rhomboid impression; conoid tubercle.

b. SCAPULA:

1. Length.
2. Length to base of spine.
3. Breadth.
4. Vertical diameter of glenoid fossa.
5. Transverse diameter of glenoid fossa.
6. Scapular index.
7. Infraspinous index.

Identify the acromion; coracoid process; supra-scapular notch; spine.

c. HUMERUS:

1. Maximum length.
2. Maximum diameter of head.
3. Antero-posterior diameter at deltoid eminence.
4. Transverse diameter at deltoid eminence.
5. Index of shaft at deltoid eminence.
6. Maximum transverse diameter of condyles.
7. Angle of shaft from vertical.
8. Angle of neck and shaft.
9. Angle of torsion. Compare with that of quadrupeds.
10. Relation to stature taken as 100.

Identify tuberosities; pectoral ridge; deltoid eminence; coronoid, radial, and olecranon fossæ; trochlea; capitellum; spiral groove; supratrochlear and entepicondylar foramina.

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[1] Fractions less than .5 of a millimeter may be disregarded; when above .5 the next higher whole number should be written. Whenever the series of measurements is sufficiently large, determine the *mean magnitude* instead of the average.

d. RADIUS:

1. Length.
2. Circumference at middle of shaft.
3. Perimetral index.
4. Humero-radial index, radius × 100 ÷ humerus.
5. Relation to stature taken as 100.
6. Relation of radius plus humerus to stature taken as 100.

Identify the tuberosity; oblique lines; sigmoid cavity; styloid process; tubercle.

e. FEMUR:

1. Length.
2. Length to great trochanter.
3. Oblique length.
4. Oblique length to great trochanter.
5. Maximum diameter of head.
6. Length of neck and head.
7. Index of *branche oblique.*
8. Height of neck at middle.
9. Antero-posterior diameter of neck.
10. Index of neck.
11. Antero-posterior diameter at subtrochanteric region.
12. Transverse diameter.
13. Platymeric index.
14. Degree of curvature.
15. Antero-posterior diameter at middle of shaft.
16. Transverse diameter at middle of shaft.
17. Pilastric index.
18. Popliteal transverse diameter.
19. Diameter Mn.
20. Diameter Mp.
21. Popliteal index.
22. Transverse diameter of condyles.
23. Condylar index.
24. Antero-posterior diameter of external condyle.

25. Angle of neck and shaft.
26. Angle of shaft from the vertical.
27. Angular index.
28. Angle of torsion.
29. Relation to stature taken as 100.

Identify the bicipital fossa; great, small, and third trochanters; tubercles of the quadratus and of the femur; intertrochanteric, spiral, and pectineal lines; gluteal ridge; linea aspera; popliteal surface; supracondylar ridges; tuberosities; intercondylar notch. Study the lamellæ in a transverse longitudinal section; pilastered femur; fossa hypotrochanterica.

Effects of dampness.—Measure a femur with the greatest care, then soak it in water for eight days and measure again to determine the amount of increase in volume.

f. TIBIA:

1. Length.
2. Transverse diameter of condyles.
3. Curve of external condyle.
4. Antero-posterior diameter at middle of shaft.
5. Transverse diameter.
6. Index of shaft.
7. Minimum circumference of shaft.
8. Perimetral index.
9. Angle of torsion.
10. Tibio-femoral index, length of tibia × 100 ÷ length of femur.
11. Intermembral index, length of humerus + radius × 100 ÷ the length of femur + tibia.
12. Relation to stature taken as 100.
13. Relation of tibia plus femur to stature taken as 100.

Identify the spine; popliteal notch; tuberosities; tubercle; oblique line; crest; internal malleolus. Note the significance and racial distribution of the curved external condyle and astragalo-tibial articulation.

Euknemia,
Subplatycnemia,
Platycnemia,
Retroversion.

Determine the stature from each of the long bones by the mathematical method.

Compare the methods of Rollet, Manouvrier, Topinard, and Dwight.

g. PELVIS:[1]

1. Breadth.
2. Height, summit of ilium to most depending part of ischium.
3. Breadth-height index, height × 100 ÷ breadth.
4. Breadth between the anterior superior iliac spines.
5. Breadth between the posterior superior iliac spines.
6. Breadth between ischial tubera, outer borders.
7. Breadth between ischial spines, tips.
8. Maximum diameter of obturator foramen.
9. Vertical diameter of obturator foramen.
10. Transverse diameter of obturator foramen.
11. Obturator index, transverse diameter × 100 ÷ vertical diameter.
12. Subpubic angle.

Dimensions of true Pelvis

13. Transverse diameter, between the ilio-pectineal lines.
14. Conjugate diameter, promontory to body of os pubis near the symphysis.
15. Pelvic index, conjugate diameter × 100 ÷ transverse diameter.
16. Oblique diameter, right and left, sacro-iliac joint to ilio-pectineal line, internal to the pectineal eminence.

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[1] These measurements are taken from the article by Sir William Turner, "Report on the Bones of the Human Skeleton," in the *Challenger Reports*, vol. XVI, part iv, p. 6.

17. Inferior sagittal diameter, from the middle of the anterior inferior border of the body of the fifth sacral vertebra and the lower border of the pubic symphysis.
18. Coccygeo-pubic diameter, tip of coccyx to lower border of symphysis.
19. Intertuberal diameter, inner borders below sciatic notch.
20. Depth of pubic symphysis.
21. Depth of pelvic cavity, from brim near pectineal eminence to most depending portion of the tuber ischii.

Dimensions of Individual Bones

22. Height-length of ilium, angle at bottom of acetabulum to summit of crest.
23. Breadth of ilium, between superior spines: anterior and posterior.
24. Iliac index, breadth × 100 ÷ height-length.
25. Breadth of innominate bone, posterior superior iliac spine to pubic symphysis.
26. Length of os pubis, angle in acetabulum to the pubic symphysis.
27. Pubo-innominate index, pubic length × 100 ÷ innominate breadth.
28. Length of ischium, angle in acetabulum to most depending part of the tuber ischii.
29. Innominate index, breadth × 100 ÷ height-length.
30. Ischio-innominate index, ischial length × 100 ÷ pelvic height.
31. Length of coccyx.
32. Breadth of coccyx.

Define the limits of the ilium, sacrum, os pubis, and os acetabulum in the os innominatum; epiphyses; position of the pelvis in the course of ontogenetic development; true and false pelvis; spines; crests; foramina; notches; symphysis; tuberosity;

illio-pectineal line and eminence; angle of inclination; sexual dimorphism in different races.

Dolichopellic,

Platypellic.

Compare the shoulder girdle with the pelvic.

THE AXIAL SKELETON

h. VERTEBRAL COLUMN:

Study the changes due to the assumption of the erect attitude; anomalies in number of vertebræ; compare curves in child and adult; lumbar curve and index:

Kurtorachic,
Orthorachic,
Koilrachic,
Ensellure.

Determine the proportions of the cervical, thoracic, and lumbar regions.

i. SACRUM:

1. Length.
2. Breadth.
3. Index.

Study the normal form and note such anomalies as an open sacral canal; oblique sacrum; irregularities in the number of parts; number of coccygeal vertebræ; *vertebra fulcralis.*

Dolichohieric,
Brachyhieric.

j. THORAX:

1. Primary type.
2. Secondary type.

Determine the number of sternal ribs; sacral and lumbar vertebræ in the embryo; length of floating ribs; cervical ribs; bicipital ribs.

k. STERNUM:

1. Length of manubrium.

2. Length of body.
3. Breadth at base of first sternebra.
4. Thickness.
5. Index, thickness × 100 ÷ breadth.
6. Relation of length to stature.

Test Hyrtl's law. Study the ensiform process; clavicular and interclavicular notches; fissura sterni; sternal foramen; ossa suprasternalia.

l. CRANIUM:

Make outline drawings of the front (norma frontalis) and side (norma lateralis) of a skull with Broca's stereograph and locate the following points:

asterion,
auriculare,
basion,
bregma,
dacryon,
glabella,
gnathion,
gonion,
inion,
jugale,
jugo-maxillary point
lambda,
metopion,
nasion,
obelion,
ophryon,
opisthion,
orbitale,
prosthion,
pterion,
stephanion.

Define the limits of the calvaria and calvarium.

Craniometrical planes: Arrange the skull for the above drawings with the alveolo-condylion plane horizontal; this plane is determined by the occipital condyles and prosthion:

Broca's horizontal or orbital, by the axes of the orbits;

Auriculo-infraorbital, by the auricularia and orbitalia.

Instruments: Measure the angles and projections with Ranke's goniometer or Verneau's cephalometer:

The arcs with a steel tape;

The larger diameters with Bertillon's calipers;

The smaller dimensions, except the optico-nasion length and the dimensions of the choanæ, with the sliding calipers.

Measurements

1. Capacity. Gage with water, Poll's method, or shot, Broca's method, or if the skull is too fragile use millet seed, or calculate the cubical capacity from the skull modulus (p. 43).
2. Glabello—occipital length.
3. Breadth.
4. Biasterial breadth.
5. Biauricular breadth, at superior margin of external auditory process.
6. Bistephanic breadth.
7. Interpterion breadth.
8. Minimum frontal breadth.
9. Bizygomatic breadth.
10. External biorbital breadth.
11. Internal biorbital breadth.
12. Bijugal breadth, between jugalia.
13. Bimaxillary breadth, maximum.
14. Bialveolar breadth.
15. Maxillary length, prosthyon to posterior extremity of arch; use thin strip of metal and measure in the middle line.

16. Basi-alveolar length.
17. Basi-nasal length.
18. Basi-bregmatic height.
19. Basion-obelion.
20. Basion-lambda.
21. Length of foramen magnum.
22. Breadth of foramen magnum.
23. Malar height.
24. Naso-alveolar height.
25. Spino-alveolar height.
26. Naso-mental height.
27. Orbital breadth, dacryon to maximum extent of largest diameter.
28. Orbital height.
29. Orbital depth, nasion to optic foramen.
30. Bidacryc breadth.
31. Nasal height, nasion to level in middle line of inferior margin of the nasal aperture.
32. Nasal breadth.
33. Palatal length, inner margin of arch anteriorly and exclusive of the palatal process.
34. Palatal breadth, between canines.
35. Palatal breadth, second molars.
36. Dental length, molars and premolars.
37. Height of choanæ.
38. Breadth of choanæ.

Arcs

39. Naso-malar, between outer margins of orbits over nasion.
40. Frontal, nasion to bregma.
41. Parietal, bregma to lambda.
42. Occipital, lambda to opisthion.
43. Total sagittal, nasion to opisthion.
44. Maximum transverse, anterior to external auditory meati.

45. Supraauricular, from superior border of the external auditory process.
46. Preauricular, over the glabella.
47. Total horizontal, over the glabella.

Indexes

48. Cranial, use the quinary nomenclature of the international agreement of 1886.
49. Vertical, height × 100 ÷ length.
50. Breadth-height, height × 100 ÷ breadth.
51. Stephano-zygomatic, bistephanic breadth × 100 ÷ bizygomatic breadth.
52. Upper facial, Kollman, nasion to prosthyon × 100 ÷ bizygomatic breadth.
53. Total facial, nasion to gnathion × 100 ÷ bizygomatic breadth.
54. Naso-malar, naso-malar arc × 100 ÷ internal biorbital breadth.
55. Orbital, height × 100 ÷ breadth.
56. Nasal.
57. Uranic, bialveolar breadth × 100 ÷ maxillary length.
58. Staphylinic, posterior breadth × 100 ÷ palatal length.
59. Dental, length of upper molars and premolars × 100 ÷ basi-nasal length.
60. Alveolar, basi-nasal length × 100 ÷ basi-alveolar length.

Relations of Arcs

61. Frontal—total sagittal, frontal × 100 ÷ total sagittal.
62. Parietal—total sagittal.
63. Occipital—total sagittal.
64. Preauricular—total horizontal.
65. Supraauricular—total transverse.

The Lower Jaw

66. Bicondylar breadth at middle of transverse axis.
67. Bigonial breadth.

68. Symphyseal height.
69. Molar height, vertical height at level of second molars.
70. Ramus height, vertical height of jaw.
71. Minimum ramus breadth.
72. Gonio-symphyseal chord, gonion to gnathion.
73. Condylo-coronoid chord, outer extremity of condyle to coronoid.
74. Bigonial arc, around anterior margin of the jaw.
75. Gonio-zygomatic index, bigonial breadth × 100 ÷ bizygomatic breadth.
76. Mandibular index, molar height × 100 ÷ symphyseal height.

MORPHOLOGICAL CHARACTERS OF THE CRANIUM

Normæ Cranii

a. NORMA FRONTALIS:

(1) *Form of the Face.*—Study the outlines of the face and determine if it is

Chamæprosopic or
Leptoprosopic.

(2) *Frontal Bone.*—Study the angle of inclination; the frontal eminences; the superciliary ridges; compare with those of the Neanderthal calvaria and with Melanesian crania; the glabella, age at which the frontal sinus appears; compare Caucasian with Mongolian; compare the internal angular process of the Caucasian frontal with that of the Veddahs; determine the percentage of occurrence of metopic sutures.

(3) *Nasal Bones and Nasal Opening.*—Study the angle at the median suture of the nasal bones; condition in the Caucasian child: Double inferior border, asymmetry, apertura pyraformis:
Macrolophic,
Microlophic,
Analophic,
Leptorhin,

Mesorhin,
Platyrhin.

(4) *Orbits.*—Observe the form: round, broad, square; direction of the principal axis, horizontal or inclined; roof obliquely inclined in Negroes; ontogenetic changes;

Prosopic,
Mesopic,
Platyopic,
Megaseme,
Mesoseme,
Microseme.

(5) *Superior Maxilla.*—Note racial differences in length; in depth of canine fossæ; history of the premaxilla; percentage of occurrence of infraorbital suture; changes resulting from the loss of teeth and absorption of the alveolar arch.

b. NORMA LATERALIS:

(1) *Facial Angle.*—Note the profile outline;

Orthognathous,
Mesognathous,
Prognathous.

(2) *Nasal Spine.*—Compare with Broca's scale; note racial difference in degree of prominence.

(3) *Profile of Jaws.*—Select six skulls to illustrate the changes taking place during the growth of the individual.

(4) *Malar Bone.*—Determine the racial differences in the degree of prominence; size of the marginal process; divided malar.

(5) *Arch of the Vertex.*—Note the type of arch; Neanderthal and Cro-Magnon types:

Scaphocephalic,
Platycephalic,
Tapeinocephalic,
Metriocephalic,
Akrocephalic.

(6) *Lineæ Temporales.*—Note position:

Feeble,
Moderate,
Well-marked.

(7) *Pterion.*—Note if the processus frontalis be present;

Pterion in K;
Pterion in H;
Epiteric bone;
Racial differences in the length of the spheno-parietal suture.

(8) *External Auditory Meatus.*—Study its form; percentage of occurrence of exostoses within.

(9) *Inion.*—Determine degree of prominence by comparison with Broca's scale.

c. NORMA VERTICALIS:

(1) *Outline.*—Regular, prominent, or flattened in any region:

Megacephalic,
Microcephalic,
Plagiocephalic,
Trigonocephalic,
Chamæocephalic,
Orthocephalic,
Hypsicephalic.
Parietal protuberances;
Sagittal crest;
Fronto-parietal bone.

(2) *Zygomatic Arches.*

Phænozygous.
Cryptozygous.

(3) *Senile Depressions.*—Note the changes in the parietals due to extreme age.

d. NORMA OCCIPITALIS:

(1) *Outline.*—Note if the outline of the transverse arch is pointed, medium, or flat.

(2) *Parietal Foramina.*—Note enlargement or absence.

(3) *Occipital Prominence.*—Observe the racial differences in uniformity of the occipital curve and in the subiniac region.

(4) *Supernumerary Bones.*—Study the morphological significance and percentage of occurrence of interparietal bones at the lambda:

Epactal;
Composite, Complete, Incomplete interparietal.

e. NORMA BASILARIS:

(1) *Foramen Magnum and Occipital Condyles.* — Determine the extent of normal · variation; third occipital condyle; fusion with atlas; percentage of occurrence of the postcondylar foramina.

(2) *Paramastoid Process.*—Examine the collections for examples of this rare anomaly.

(3) *Alveolar Arch.*—Compare the types found with those of other races: U-shaped, parabolic, elliptical; torus palatinus.

Dolichouranic,
Mesuranic,
Brachyuranic,
Leptostaphylin,
Mesostaphylin,
Brachystaphylin.

(4) *Palatal Suture.*—Note racial and individual differences in this suture and in the posterior nasal spine.

(5) *Alveolar Hyperostosis.*—This anomaly will be found to occur much more frequently in some American groups than in others.

(6) *Teeth.*—Study the teeth in a series of skulls ranging in age from fetus to adult; their value as a criterion of age in skulls whose age is not known; phylogeny; supernumerary or undeveloped teeth; racial variation; tuberculation; rules for the identification of single teeth; direction of incisors; wear; pathological change: caries, abscess, exostosis, malformation.

(7) *Hyoid Bone.*—Make an outline sketch of the bone and

name the parts; percentage with united cornua; racial variation in the shape of the body.

Sutures

Note the percentage of occurrence of supernumerary sutures not before examined; degree of complexity, simple, moderate, or complicated; condition, open or closed, note whether inner table alone is synostosed; value of the condition of the sutures as a criterion of age; Gratiolet's classification of races; effect of premature synostosis upon the direction of development of the cranium.

Wormian Bones.—Note their number and position; use Broca's scale of size.

Interior of the Skull

(1) Study the sulci, pachionian depressions, meningeal grooves, digital impressions.

(2) *Aymard Fossa.*—Determine the percentage of occurrence; racial differences.

(3) Measure thickness of parietals; diploë; vitreous table. Pachycephalic.

Capacity

(1) Test the three methods of gaging (p. 36) with Ranke's bronze skull, taking the average of five trials and accepting no result that varies widely from the mean. Study Schmidt's corrections for the method with shot.

(2) Study racial and individual variation; compare with the capacity of prehistoric crania.

(3) Determine brain weight from cranial capacity by Manouvrier's, Schmidt's, and Welker's formulæ.

Variations in the relations of capacity and brain weight due to sex and age.

Moduli.—Test the various methods of determining capacity from principal measurements.

Cranial Criteria of Sex

Male.	*Female.*
1. Greater size, weight, capacity.	1. Smaller, lighter; varying in relation to the male skull in the different races.
2. Projecting glabella and superciliary arches.	2. Glabella small or wanting; superior margin of the orbits sharper.
3. Mastoid processes, inion, and crests for the attachment of muscles larger.	3. Mastoid processes smaller, inion and crests smaller or wanting.
4. Frontal sloping backward.	4. Frontal vertical with more pronounced frontal eminences.

Deformed Crania

1. *Pathological Deformation.*—Determine the cause; platybasic; synostosis; posthumous.

2. *Ethnic Deformation.*—Examine the collections for deformations due to head-dress: unconscious deformation.

3. *Artificial Deformation.*—(a) Occipital, (b) frontal, (c) fronto-occipital, (d) fronto-sincipito-parieto-occipital, (e) various.

Identify the *trepanned skulls* in the museum collection.

Statistics

Arrange a seriation table for each of the three measurements, length, breadth, and height, of the series of skulls measured.

Record maximum and minimum.

Extent of variation.

Theoretical mean of variation.

Compare the average, mean, and median values for the three measurements, length, breadth, and height, of crania.

Graphic Representation of Mathematical Terms:

Allen's "Terrace Method."

Method of loaded ordinates.

Bar diagrams.

B.—HUMAN COMPARED WITH SIMIAN TYPE

MATERIAL.—Identify the two species of anthropoid apes represented in the osteological collection and compare the several bones with those of the human skeleton.

a. *Clavicle:*

Length.

b. *Scapula:*

1. Length.
2. Length to base of spine.
3. Breadth.
4. Scapular index.
5. Infraspinous index.

Study also published tables and indexes; phylogeny of the coracoid.

c. *Humerus:*

1. Length.
2. Antero-posterior diameter at deltoid eminence.
3. Transverse diameter.
4. Index.
5. Angle of torsion.

Note the occurrence of the supratrochlear foramen.

d. *Radius:*

1. Length.

Compare the length with that of the humerus: of the arm exclusive of the hand, with the leg exclusive of the foot. Note the presence or absence of the os centrale. Size of thumb.

e. *Femur:*

1. Length.
2. Antero-posterior diameter at middle of shaft.
3. Transverse diameter.
4. Pilastric index.
5. Degree of curvature.
6. Angle of neck and shaft.
7. Angle of shaft from the vertical.

8. Angle of torsion.

f. *Tibia:*

1. Length.
2. Antero-posterior diameter at middle of shaft.
3. Transverse diameter.
4. Index of shaft.
5. Curve of external condyle.

Note the degree of retroversion.

Compare the length of phalanges with that of tarsus combined with metatarsus; the angle of inclination of the tarsus; divergence and small size of the great toe; two-jointed little toes.

g. *Pelvis:*

1. Breadth.
2. Height.
3. Index.
4. Transverse diameter of true pelvis.
5. Conjugate diameter.
6. Pelvic index.
7. Length of coccyx.

h. *Vertebral Column:*

Study the curves; the number of vertebræ in the several segments; total number of presacral vertebræ; long spinous processes of the cervical vertebræ.

i. *Sacrum:*

1. Length.
2. Breadth.
3. Index.

Note the number of vertebræ fused in the Anthropoid sacrum.

j. *Thorax:*

Determine the type; number of sternal ribs.

k. *Sternum:*

1. Length of body.
2. Breadth at base of first sternebra.

3. Thickness.
4. Index, thickness × 100 ÷ breadth.

I. *Cranium:*

1. Capacity.
2. Length.
3. Breadth.
4. Index.
5. Orbital breadth.
6. Orbital height.
7. Orbital index.
8. Nasal height
9. Nasal breadth.
10. Nasal index.
11. Cloquet's angle.

Compare the size of face with that of brain-case; superciliary ridges; low frontal; crests and ridges; position of foramen magnum; shape of palate; teeth, size of canines and third molars, diastema next the canines, number of tubercles on the molars, relative size of the teeth.

Note the extent to which synostosis has progressed, especially in the nasal and premaxillary bones; the transverse palatal suture; inferior border of the orbits as compared with the superior margin of the nasal opening:

Study the skull of the lemur, noting especially the teeth and the absence of the partition between the orbital and temporal fossæ.

ANTHROPOGRAPHY

I. PHOTOGRAPHY:

1. Take the full-length front view of the standing subject on the left third of the plate on a scale of $\frac{1}{31}$.

2. Expose the middle third of the plate for the right side, in exact profile.

3. Expose the remaining third of the plate for the back view.

4. Develop the negatives.

5. Make blue-prints from the negatives.

II. PLASTER CASTS:[1]

1. Make a two-piece mold of a *hand.*
2. Make a mold in three pieces of a *foot.*
3. Make a mold in one piece of a *face.*
4. Make a cast from each mold.

III. FINGER-PRINTS:

Take digital impressions of the right thumb, index, middle, and third fingers of the subjects studied.

IV. ANTHROPOMETRY:

The measurements to be taken upon the living subject are those recommended in the *Notes and Queries on Anthropology*, edited for the British Association for the Advancement of Science, third edition, p. 14.

Measure ten persons.

ESSENTIAL MEASUREMENTS

1. Head . . . . maximum length.
2. “ “ breadth.
3. Nose . . . . length from base to nasion.
4. “ breadth across nostrils, without compressing them.
5. Projections of the head . . . . . from vertex to nasion.
6. “ “ “ “ “ “ mouth.
7. “ “ “ “ “ “ chin.
8. “ “ “ “ “ “ tragus of ear, the base of the projecting portion of the ear which guards the opening of the meatus.
9. Bizygomatic breadth.

9a. Length of face from nasion to under surface of chin.

10. Length of arm from head of humerus to end of middle finger.
11. Length of cubit from elbow to end of middle finger.

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[1] Molds and casts must be made in the presence of the instructor.

12. Length of the hand along its back.
13. Length of foot.
14. Sitting height.
15. Kneeling height.
16. Standing height, the head held erect but not bent backward in an unnatural position.
17. Height to chin.
18. Height to sternal notch.
19. Height from internal malleolus to the ground.
20. Span of arms, shoulders horizontal.

ADDITIONAL MEASUREMENTS

21. Maximum breadth of shoulders.
22. Maximum breadth of hips.
23. Diameter of face, external biorbital breadth.
24. " " " " biocular breadth.
25. " " " internal biocular breadth.
26. " " " bigonial breadth.
27. Ear, maximum length.
28. " breadth from base of tragus to outer rim.
29. Height of umbilicus to the ground.
30. Biorbito-nasal arc.
31. Circumference of the chest, in repose, forced inspiration and forced expiration.
32. Minimum supra-malleolar circumference of leg.
33. Maximum supra-malleolar circumference of leg.
34. Tracing of hand.
35. Tracing of foot.

} Mark the sub-styloid and sub-malleolar points and the extremities of the meta-carpo- and metatarso-phalangeal joints.

SPECIAL MEASUREMENTS

(*a*) Length of body from seventh cervical spine to lower end of coccyx.

(*b*) biacromial breadth.

(*c*) biiliac crest breadth.
(*d*) Length of arm, acromion to humero-radial line.
(*e*) Length of forearm, humero-radial line to tip of styloid process.
(*f*) Length of thigh, antero-superior iliac spine to external femoro-tibial line.
(*g*) Length of leg, femoro-tibial line to end of *external* malleolus.
(*h*) Height of external malleolus from the ground.

V. DESCRIPTIVE CHARACTERS:

(*A*) After measuring the subjects describe them according to the schedule of characters on pages 12 and 14 of *Notes and Queries.*

(*B*) Determine the color of eyes with the aid of the Bertillon color chart.

(*C*) Examine the fold of skin at the inner angle of the eye as directed and explain the meaning of the terms: caruncula lacrymalis, epicanthus, plica semilunaris.

(*E*) Cut and mount upon a microscopic slide a cross-section of the hair of the head.

SOPHIOLOGY, OR THE SCIENCE OF ACTIVITIES DESIGNED TO GIVE INSTRUCTION

BY J. W. POWELL

Sophiology is the science of instruction. I shall treat the subject under two rubrics: first, the nature and origin of the opinions which are inculcated by instruction, and, second, the agencies of instruction.

OPINIONS, OR THE SUBJECT-MATTER OF INSTRUCTION

Opinions are about particles severally or about them conjointly as they are organized into bodies. Particles thus considered are found to have essentials, relations, quantities, properties, and qualities. There are no essentials without relations, no relations without quantities, no quantities without properties, and no properties without qualities, for the world is concrete and there is nothing abstract but in consideration. Essentials, relations, quantities, properties, and qualities we call categories.

When the world is looked upon as concrete, and bodies are discovered, it is found that every one is composed of a group of bodies; but to express the fact without confusion it is better to say that a body is a group of particles, for when one body is considered as a constituent of another it promotes clear statement to say that the compound body is composed of particles. Ultimate particles have never been reached by analysis unless it be in the ether.

Concepts grow as the products of thought. The stream of thought is composed of instantaneous and successive judgments, some of which are duplicated and endlessly reduplicated. While mentations arise from sense impressions, like sense impressions are oftentimes repeated and by association past mentations are revived, so that there is a vast repetition of the instantaneous judgments as they follow on through the stream of mental life.

It is thus by repeated and revived mentations as judgments that concepts or notions arise. These notions constitute opinions. We cannot make a complete consideration of opinions without considering their origin in the compounding of judgments into concepts.

While opinions often change, they are not necessarily born to die. Correct opinions developed in the individual and propagated from man to man become immortal, while only incorrect opinions ultimately die; but the vast body of opinions as they arise from moment to moment are born only for an ephemeral life. Of those that have appeared upon the stage of history because they have been accepted by the great thinkers, it remains to be said that still the many die and the few live. While they live they are esteemed as science, when they die they are esteemed as errors; hence sophiology can be defined as the science of opinions, and their classification as errors or truths when accepted as such by the leaders of human thought, together with the methods of discovering and propagating such opinions.

We are now to consider how opinions originate and change. For this purpose we will consider them in groups in the order in which they were developed by mankind. These groups fall into five rubrics: animism, cosmology, mythology, metaphysic, and science. Animism, which is the belief in ghosts, first prevailed. We will, therefore, consider this subject first. For the original formulation of this doctrine we are indebted to the great ethnologist Edward B. Tylor.

The science of ethnology teaches the nature and origin of the ghost theory; that is, it discovers the nature of ghosts and explains how men come to believe in them. There are many people who believe in ghosts, the opinion being a survival from primitive society; but with tribal men the belief is universal. Ethnology also teaches the nature and origin of primitive cosmology, which has now become discredited, though vestiges of it exist in the opinions of simple folk, when it is called folklore. I have previously set forth the nature and origin of animism and cosmology.

MYTHOLOGY

Heretofore in treating of the fundamental processes of psychology the nature of consciousness, inference, and verification have been set forth. Inference alone may and often does result in error, while truth is assured only by verification. Every judgment involves a consciousness and an inference; and if the judgment is valid, its validity can be established and known only by verification. The repetition of an erroneous judgment is often confounded with verification, and thus men come to believe in fallacies. Of the multitude of errors in judgment those most often repeated by mankind, and especially those which have been coined by the leaders of thought, are those which are woven into mythology. Though we have a criterion by which to distinguish true from erroneous judgments, still judgments are compounded into notions that ultimately are exceedingly complex, and it is often found difficult to resolve notions into their constituent judgments; so that while there is an infallible criterion, it is not easily applied. We are not here dealing with the whole subject of psychology, but only with the leading concepts which distinguish science from mythology. That history of opinions which is often called the history of philosophy (but which is mainly the history of metaphysic), together with the history of science, gives us the data of what is here called *sophiology*. Science has already cost a vast amount of research, and we may safely prophesy that only a beginning has been made. It would be an inane proceeding to attempt to forecast what research will ultimately unfold, but perhaps it would not be unprofitable to review in outline the characteristics of the fundamental errors of mankind in so far as they have already been detected.

False inferences primarily arise through referring sense impressions to wrong causes. A term is needed for this error, and it will be called *imputation*. Imputation, then, is the reference of a sense impression of which the mind is conscious as an effect, to a mistaken cause. This wrong cause may be a wrong body or it may be a wrong property.

Let us now see if these two propositions can be made plain. The savage hears the thunder and infers that it is the voice of a bird. This is imputing a sound to a wrong body. Birds have voices, and not knowing the cause of the thunder, the savage imputes it to a bird; but as he knows of no bird with such a voice, he imagines a new and unknown bird. Thus an imaginary bird is created as the explanation of thunder. The creation of imaginary things to explain unknown phenomena is mythology. Thunder may be interpreted as the voice of a bird in such manner by many people until it falls into common speech; thus an imaginary thunder-bird may become the theme of much thought and much talk, and at last a number of stories may grow up about it. The barbarian who drives a span of horses to a war chariot becomes accustomed to its rattle and compares it to thunder. Then the thunder itself is symbolized as the rattle of the chariot of the storm. In this case a new imaginative being is created—a storm god with his chariot in the clouds. So the reference of an effect to an erroneous cause results in a myth.

There may be many analogies called up by the noise of thunder, and there may be many myths established in such manner; but it is manifest that none of them can be verified. In the course of the history of verification, which is the history of science, an hypothesis as to the cause of thunder may be verified; when such verification is reached, all myths relating to thunder die as notions, and the scientific concept is established. All false philosophy, that is, all erroneous explanation, must necessarily lack verification. It may be believed and become current in the philosophy of a people or of a time, and this current belief may be held as science; but sooner or later an erroneous notion, however widely believed, will present some incongruity to the developing concepts of mankind and will challenge such attention that new hypotheses will be made to be examined until one is verified. When the verification comes, science is born, and the old notion is relegated to mythology. Philosophy is the explanation of causes; whatever else may be involved in the term, this must be involved. It is the central point in philosophy, though not the whole of philosophy. We may now make a definition of the growth of science and the discovery of error. Research, by which science grows, is the verification of hypotheses and the elimination of incongruous notions, and such discarded notions as have been previously and generally received as science are relegated to mythology. Let us illustrate with another example.

Conceive a people in such a primitive stage of culture as not to know of the ambient air. Such people have existed and some even yet exist. In all that culture known as savagery this fact is unknown. The air is unseen; but it often has corporeal motion, and is then called wind, and this wind produces effects. Blow upon your hand, or invigorate the fire with your breath, and then contemplate the wind among the trees: How like the breath is the wind! Now impute the north wind to some great monster beast, and you do only that which millions of people have done before. Many savage peoples explain the winds in this manner, imputing them to monster beasts. In this instance, and in ten thousand others that can readily be supplied, the error of imputing an effect to the wrong cause as a wrong body results in the creation of imaginary bodies, which is the essence of mythology.

When air is unknown there are other things besides breath which the wind suggests. You can blow the fire with a basket tray, and you can fan your brow with an eagle's wing. So the wind suggests a fanning, and may be explained in this manner. But what is it that fans? A bird with wings. If the wind fans it must be accomplished by some great sky-bird. The myths of such sky-birds are common. After this manner a host of imaginary animals are created.

To the wildwood man, who roams the prairie and haunts the forest, the world is the grand domicile of beasts. Beasts are men, and men are but beasts. To his mind the beasts are rather superior to men. The beasts have more magical power and hence are often immeasurably superior to human beings. The savage admires the superiority of the beast and longs for his activities; he is forever contemplating the accomplishment of beasts — the wonders which they can perform — and is envious of their skill in what he supposes to be magic. He sees the trout dart from bank to bank in the brook and is amazed at its magical powers, and from admiration he often proceeds to adoration. He sees the serpent glide over the rock, swift without feet and having the sting of death in his mouth; in this respect he seems superior to man. He sees the chameleon gliding along the boughs of trees in sport with rainbow hues, and is delighted with its magical skill. He sees the eagle sail from the cliff to the cloud region, at home in wonderland. He sees the lion walk forth to conquer with occult majesty. Yes, all the animal world is magical, and men are but degenerate animals. Inspired with wonder, he is filled with adoration, and the beasts are gods. The world is thus the home of men and gods, and the gods are the beasts.

A mythology has sprung up with every primordial language. These languages are found to be many—how many we do not know, but certainly there have been many thousands, and with every tongue a mythology has been developed. The tribes of mankind scattered over the whole habitable earth between the polar walls of ice, living in small clusters, every one having a distinct language and pouring out the generations that have peopled the earth, have created a host of imaginary or mythic bodies.

One of the methods of reasoning by means of which monsters are produced is to impute to one property that which is due to another. Water is transparent and water reflects the light. These two facts are universally observed in savagery. It is something with which men are familiar as an experience growing from day to day and from hour to hour. There is another fact with which they are almost as well acquainted, namely, that the eye is transparent, and also that it reflects images. The eye is the organ of sight, and it is not strange that the power of vision should be referred to transparency. The reflection of light is an unknown and undreamed property, but transparency is well known, and images are well known, and images appear in vision. Thus, with the Zuñi Indians, as with many of the tribes in North America, the property of transparency is esteemed as vision: all water sees, and the dewdrop is the eye of the plant. It is long before it is learned that transparency is a structure which transfers a motion, while vision is a mentation. Thus force as reflection and vision as mentation are explained as transparency.

The mythology of the Amerinds is replete with myths concerning the powers of thought. There is no error more common than that of confounding thought with force. When the savage theurgist tells us that his hero can think arrows to the hearts of his enemies he makes this mistake. So it is believed that there are mythic men who can think their boats over the river; they can think themselves to the topmost branches of high trees; they can think rocks onto the heads of their enemies. There is no myth more common than this one of confounding thought with force, and there is no myth that has a more venerable history. No Egyptian king has received higher honors, for it is embalmed in the cerements of learning.

We now know that heat is a mode of motion and that cold is a low degree of heat; in the same manner we know that color is a mode of motion, and we measure the number of vibrations in the ether which occur in a unit of time that it requires to produce a variety of color.

The love of knowledge is the most delightful plant in the garden of the soul. In the individual the failure to make correct judgments entails innumerable evils, while correct judgments lead to good. Judgments directly or indirectly lead to action, and that action is wise as judgments are wise. Every hour, almost every moment of the day, brings the lesson that knowledge is advantageous, and these lessons are repeated by every individual in every generation. Thus there is an acquired and hereditary love of knowledge. Mental life presents a vast succession of judgments, some correct, others incorrect, and as they come they are enwrought in notions that inspire activities, and by these activities the notions themselves are adjudged. Those notions that stand the test are held fast, those that fail are cast away, for men love the true and hate the false. All of this is so evident that it seems commonplace, and yet we are compelled to account for the intensity with which men cling to mythology.

The repetition of a judgment is sometimes a valid confirmation, but it is often the bulwark of fallacy. Judgments many times repeated become habitual, and habitual errors are hard to eradicate, for they are venerable. Errors associate in communities; as they dwell in the mind they constitute a fraternity for mutual protection. Assail one notion with the club of incongruity and a host of notions arise in its defense. Perhaps this will fully explain the fact, which we are to consider, that men invent arguments to sustain myths. He who contemplates this state of affairs may readily fall into despondency, for there seems to be as much mental activity occupied in the invention of false reasons as in the discovery of truth; but on further contemplation it is seen that science has an advantage in that its gains are constant and imperishable, while the gains of error overstep themselves and sooner or later exhibit new incongruities and hence are self destructive.

The appeal to antiquity is the appeal to habit, and the appeal to habit is the appeal to repetition, which must always be distinguished from the appeal to verification. The argument from antiquity is a two-edged sword, and may be an instrument of suicide; but it is the first argument used to support a myth. "It was taught by our forefathers" is inscribed on the banner of mythology. But can we not use the argument from experience? Yes, if we distinguish the method of verification from the method of repetition. This is our only criterion.

Myths are defended by another argument which must now be set forth. It may be called the argument from intuition. Plants grow from seeds; animals from eggs. The development of the individual from the germ is called ontogeny. The process of ontogeny has been well recognized from primordial human time. Germs also develop from generation to generation. The acorn is a very different seed from that of the plant from which oaks were developed. The egg of the bird is a very different germ from that of the egg from which it was developed through successive generations. This development of germs is also called the development of species. The process is now well known to science, but it was long unrecognized except in a vague way. The process is called phylogeny. Ontogeny and phylogeny together are termed evolution. While ontogeny was more or less fully recognized in antiquity, phylogeny was very dimly discerned and it was supposed to be exceedingly restricted; so that while there might be varieties of plants and animals, it was held that all living creatures are encompassed by barriers beyond which they cannot pass. It could be observed that plants and animals grow from germs, but that races grow by minute modifications of germs accumulating through many successive generations was not so easily observed. That the offspring is like the parent is a more conspicuous fact than that the offspring is a modification of the parent. Therefore it was believed that every existing species is the descendant of a primal species, and the number of primal species has remained constant. Finally it was discovered that species become extinct and that species begin at different periods in the world's history; this was revealed by the science of geology. Thus the notion of constancy of species was finally shown to be erroneous, and it has been replaced by the scientific concept of the evolution of species.

So much of what is now commonplace science must be given that we may understand the doctrine of primordial intuition, which was invented as a defense of mythology. As plants grow from seeds by minute increments through the process of ontogeny, and seeds grow from other seeds by minute increments by the process of phylogeny; as animals grow from eggs by minute increments, and as eggs themselves grow from other eggs by minute increments, so ideas grow ontogenetically by minute increments of judgments and also phylogenetically by minute increments of judgments. Thus the notion grows in the mind of the child by ontogeny, and the idea grows in the mind of the race from generation to generation by a process analogous to phylogeny. As man once believed that plants are inexorably limited to specific forms that are constant, as he once believed that animals are limited to specific forms that are constant from generation to generation, so men have believed that ideas are limited to specific forms that are constant. That which in plants and animals was called the limitation of species, in ideas was called intuition, and by that term was meant the limitation of certain specific ideas. It was recognized that ideas grow or develop in the individual, but it was denied that they develop in the race. Sometimes it was conceded that ideas or concepts grow phylogenetically, that is, they are developed in the race; but it was held that there are certain fixed limits to ideas or notions which cannot change, these limits being fixed primordially in the mind. Now, there have been many modifications and many phases of this doctrine which we cannot here elaborate, but that which is essential to all forms of the doctrine of specific innate ideas has been set forth.

We must now see how this doctrine is used to shore up mythology.

Venerable errors are supposed or affirmed to be universal and also to be innate—that the notions which they involve have been preserved from primordial time, and that they were given to man at his creation when all species were created. This doctrine of primordial specific innate ideas is one of the most important themes of scholastic learning. Born in savagery, flourishing in barbarism, it is believed in civilization, and its exposition ultimately becomes one of the tests of scholarship. When the doctrine had reached this stage, so-called philosophers or mythologists attempted to defend these primordial concepts. This attempt culminated in the *Critique of Pure Reason*. This defense of mythology by Kant led to the usual result; he, or at least his followers, supposed the argument to be exhausted and the question of innate ideas set at rest when it was stated anew as innate forms of ideas. A calmer generation discovered the incongruity of this doctrine with the concepts of evolution born of science. While the doctrine remained vague, these incongruities were not so apparent; but when it came to be carefully formulated, it was doomed. It may be claimed that the doctrine of the evolution of concepts by experience in the race as in the individual is established.

Primarily judgments are formed as guides to action. In this first stage erroneous judgments are detected by the test of action. If the action proves unwise, the judgment is wrong; but as judgments multiply and are compounded in notions, a new test of error is developed, which is the incongruity of notions. But the discovery of incongruity is not the discovery of the specific error. The incongruity is a relation between two or more notions; some one of these notions must be erroneous, but which one is not revealed by the incongruity. The error is discovered only by submitting the judgments to trial by verification. The incongruity does not reveal a particular error, but only the fact that some error exists; on the other hand congruity does not prove validity.

Mythologic notions may well be congruous with one another. There is no incongruity between the notion of the thunder-bird and the notion of the wind-bird. If there is a bird which roars in the heavens, there may be a bird which breathes in the hurricane:

the one notion serves to confirm the other. It is strange how congruous mythic notions are with one another. Study the mythology of any people as a system, and you will be surprised at the congruity of the notions which it reveals. Compare one mythology with another, and often they will be found strangely antagonistic. This congruity of mythic concepts in one system is a fact so conspicuous as to challenge the attention of thinking men, and it is early discovered and widely used alike in savagery, barbarism, and civilization.

This method of reasoning from the congruity of notions was finally developed in early civilization into a body of doctrine called dialectic. By this doctrine any mythic notion could be expounded as a starting point and other mythic notions brought into judgment before the one selected and found to be congruous, and by this logic proved correct. Proceeding in this manner from notion to notion, many are verified, and the assumed original notion is in this same manner found valid. It is thus that a special system of reasoning in the interest of mythology is gradually developed.

If this system of logic were not already named, I should be tempted to call it Kanosh logic. Kanosh was the chief of a Shoshonean tribe in the central part of Utah, where cinder-cones and lava-beds are found. In years of my youth I was wont to sit at the feet of the venerable Kanosh and listen to mythic tales. Once on a time he explained to me the origin of the cinder-cone and the scarcely cooled lava which in times past had poured from it. He attributed its origin to Shinauav—the Wolf god of the Shoshonean. When I remonstrated with him that a wolf could not perform such a feat, "Ah," he said, "in ancient times the Wolf was a great chief." And to prove it he told me of other feats which Shinauav had performed, and of the feats of Tavoats, the Rabbit god, and of Kwiats, the Bear god, and of Togoav, the Rattlesnake god. How like Aristotle he reasoned!

There is a phase of the defense of mythology which must not be neglected, although its contemplation is a source of sadness because it is an exhibition of the worst traits of mankind. It has already been seen that in the defense of mythology subtile arguments are produced, systems of psychology are born, and methods of logic are invented. The notions of mythology are not only woven into theories of institutions, but institutions are devised for their propagation and defense.

Institutions are founded in the natural conditions for family organization. The love of man for woman and the love of woman for man, together with the love of parents for children and children for parents, are all involved; thus institutions have their origin in domestic love. The social life which develops from this germ, having its roots in domestic love and sending its branches into all the ways of life, constitutes the sheltering tree to protect mankind from the storms of foreign war and internal conflict. Peace, equity, equality, liberty, and charity are concepts at the foundation of institutions. An attack upon institutions is thus an attack upon all these sacred principles, so man defends them to the last extremity. On the other hand, men are constantly seeking to improve them, and that which is beneficent to one may be malign to another. When the tendrils of mythology are entwined in the branches of institutions, the attempt to substitute science for myth often appears to be an attack upon the institutions in which it is entwined, and thus the reformer and the defender come to blows. When the defender of venerable mythology is also the defender of ancient institutions, he is easily convinced that his warfare is holy. When he is the constituted and official defender on whom the armor is buckled and by whom the sword is grasped, he is watchful and ready for the fight. Then his honor is at stake and his emoluments threatened.

One element of this controversy — the saddest of all — is the passion for thaumaturgy which mythology produces. Then unknown beings with occult attributes people the world, and the air reeks with mystery. Men who deceive themselves are deft in the deception of others. The love of thaumaturgy becomes one of the monster passions of mankind that stifles the pure love of truth. When thaumaturgy becomes a source of gain, and greed is wed to wondercraft, there springs from the union a progeny of devils that wreak on the teachers of truth the tortures of rack and fagot.

In savagery names are believed to be natural attributes of the objects which they signify. The many significations which the same word may have are usually related to one another, but even when they are not related they are so habitually associated that affinities are constantly suggested. The development of science to an important degree depends on the distinct recognition of different meanings, and in order that scientific reasoning may proceed it is always found necessary to define words with exactness and to adhere to constant meanings; but mythological reasoning does not observe these precautions, and often succeeds in making its arguments plausible by the uncertain use of words. It must not be supposed that this is a device on purpose to deceive, for it is often a potent agency of self-deception.

Trope is not an unmixed evil, although it is a dangerous device. When knowingly used and legitimately derived it adds power and vigor to language, and we have already seen that it is a necessity in nascent knowledge. Ultimately it becomes the foundation of the highest fine art known to man, for it is an essential element in poetry; but that which is legitimate and useful in poetry is the bane of scientific reasoning, especially when it is used without comprehension. Mythology is thus eminently tropical. While it is held as science, its tropes are believed; when its incongruities are discovered and its tropes recognized, mythology is often supposed to be a crude poetry. When dialectic methods of reasoning prevail, equivocal or duplicate meanings of words are common. At last mythologic reasoning discovers the advantage to be derived from the use of words with many meanings, and it becomes an essential and recognized element in such reasoning. Hegel, who is a master of dialectic, not only lapses into many equivocal meanings, but purposely uses them and boasts of the advantage to be derived from his native tongue by reason of the many meanings which its words present. His first great work, *The Phenomenology of Mind*, is esteemed by him and by his followers as the effort by which the foundation of his philosophy was laid. When this work is read paragraph by paragraph and the meanings of words compared throughout the entire book, it will be found that the argument depends on the equivocal use of words. One can imagine the delight with which he hailed the discovery that he could make an attractive argument and a chain of seemingly invincible reasoning in this manner. His followers have claimed for him some profound secret, but with this key to the Hegelian riddle it is easily read.

METAPHYSIC

Metaphysic is a system of explaining how the essentials of bodies are generated one from another.

Pythagoras taught that unity as number is the primordial essential from which others are derived, the conception being in the spirit of tribal cosmology in which all things are generated or begotten by parents.

Plato considered extension as form to be the primordial property. He exalted mind perhaps more than any philosopher before his time, and with transcendent literary skill sounded its praises. But as he considered form to be the property from which it was derived, he translated mind into terms of form and thus succeeded in imposing upon all coming time the word for form as the term signifying notion or concept. Thus idea, which primarily signified form, is now a term of mind.

Aristotle seems to have considered force as the primal property from which all other properties are derived, for thus I interpret his doctrine of energy. Certain it is that since his time there have been metaphysicians who have held this doctrine. Perhaps this error has more widely prevailed than any other doctrine of the genesis of the essentials. Aristotle's theory of mind is vague, and his reader may easily defend the proposition that he derives energy from mind, rather than mind from energy.

Spencer resolves extension into force, and impliedly, though not overtly, resolves duration into force in his discussion of the doctrine of evolution; and finally he resolves mind into force, so that Spencer is the modern champion of this theory. Of course Spencer does not consider the derivation to be parental genesis, but genesis by evolution. The American philosopher of this school, Mr Lester F. Ward, also derives mind from force by evolution.

Still other philosophers have taught that persistence is the primal property, from which all others are derived. This philosophy has been taught as a reification of being, and is known as *ontology*. The term "being" signifies existence, but it is also used in Aryan languages as the common asserter. This double use has always been found in ontology. The prevalent philosophy of medieval time was ontology. Being is not held to be the father of properties, but rather the substrate.

Idealism is the doctrine that the other properties are produced by mind, the foundation of which is consciousness. It began with Berkeley and has been elaborately formulated in the German of Kant, Fichte, Schelling, and Hegel. Mind is reified, and the physical world has its genesis in the human mind, or, as some think, in the mind of God who endowed the human mind with faculties to think his thoughts as he thought them in creation. The physical world is thus an illusion called phenomenon, the reality being noumenon or thought. Two schools of idealists are found—one speaks of noumenon as mind, the other as will. In one school mind is the only substance, in the other will is the only substance.

The essentials with their relations, quantities, properties, and qualities have severally given rise to a system of metaphysic. As we have called them they are the system of Pythagoras, the system of Plato, the system of Aristotle, the Medieval system, and the system of Berkeley. The last system, when will is substituted for mind, may be called the system of Schopenhauer, as a variety of the Berkeleyan system, which also has many other varieties.

We are now prepared for a definition of metaphysic: Metaphysic is the doctrine that one of the essentials of a particle or body is primordial, or the one from which the others are derived. They may be derived by parental genesis, as in ancient metaphysic; by evolution, as in modern materialism; or by creation, as in idealism.

The Pythagorean and the Platonic systems have perished from the earth. The idealists claim that Plato was the founder of their system, and that Aristotle was also a believer in it. Thus they interpret these two Grecian metaphysicians, as I think, erroneously. The medieval system is waning, though it may have some disciples; but apparently they have become idealists. There yet remain to us the Aristotelian and the Berkeleyan. The Aristotelian has been revived by Spencer, greatly expanded and placed upon a clearer foundation; Spencer has many illustrious disciples. Idealism in some one of its many forms prevails widely among metaphysicians. Enlisted among its disciples are many scholarly men who take a leading part in the metaphysic of the schools. They have usually not occupied themselves with the physical sciences, but there are some illustrious exceptions. The Aristotelian system, especially as revived by Spencer, is usually called *materialism*. Materialism and idealism are now rivals in the metaphysical world.

Materialism is a theory of the existence of the world as constituted of forces. This theory is perhaps best expounded by Boscovich as points of motion, not points in motion; centers of motion, not centers in motion. There are no atoms or molecules in motion, but there are atoms and molecules of motion; there are no stars in motion, but stars of motion; there are no waters or gases in motion, but there are gases of motion; there are no rocks in motion, but there are rocks of motion; there are no plants in motion, but there are plants of motion; there are no animals in motion, but there are animals of motion; there are no thoughts that are the motions of brain particles, as there are no brain particles, for thoughts are motions themselves.

Oftentimes idealism is a theory that all the material objects of the universe, other than human beings, are created or generated by mind, and that human beings are the real things and all other things are but the concepts of human beings. There are no stars, but only human concepts of stars; there are no waters, but only human concepts of waters; there are no rocks, but only human concepts of rocks; there are no plants, but only human concepts of plants; there are no lower animals, but only human concepts of lower animals. God and human beings are realities which manifest themselves to one another in perception and conception as ideas in the objective world.

Sometimes it teaches that science is a method of expressing ideas; it is but a system of language and has no other significance than that of a system of language. There is no objective concrete world with which science deals; but there are ideas with which science deals, and the whole function of science is to reduce these ideas to their simplest expression. There is no objective standard of truth; there is only a subjective standard of opinion, and all scientific research is the attempt to formulate these opinions or ideas or concepts or perceptions in universal terms. Science is only a device of language; mathematics is only a device of equations; chemistry is only a device of atoms; astronomy is only a device of worlds; geology is only a device of formations; botany is only a device of cells; biology is only a device of organs. All of these devices are useful for linguistic purposes; they do not express objective reality, but only subjective ideas. The world is a realm of ideas and words; it is not a realm of objective real things!

Idealism accuses all scientific men of being materialists, and it divides mankind into two groups—the good and the evil. The good are idealists, and the evil are materialists. The idealists are from heaven and the materialists are from hell. Idealism accuses materialism of ignoring all values in the world; it forever seeks to belittle scientific research. Chemistry is only a controversy about words; astronomy is only a disputation about words; physics is only a disputation about words; geology is only a disputation about words; botany is only a disputation about words; and zoölogy is only a disputation about words!

Materialism accuses idealism, as being the enemy of science, of rejecting every scientific discovery until it can be translated into terms of idealism, being the great bulwark of ignorance and the fortress of superstition. As idealism is interpreted by materialism, the accusations are true; and as materialism is interpreted by idealism, the accusations are true. Materialism is arrayed against religion, and idealism is arrayed against science.

Idealism is a theory that there is no objective reality, or, to use the language of modern idealism, there is no trans-subjective reality. Symbols are signs of ideas, but not signs of objects. The objective world thus becomes the creation of thought. The apparent or phenomenal objective world is created magically by thought. There are no stars as objective realities; there are only stars by the magic of thought. Astronomy is not a science of orbs which depends on the existence of objective realities; but it is a science of words which depends on our concepts, and contributions to astronomy are only contributions to language and consist only in a better method of using symbols as words to describe our concepts. There are no atoms or molecules or substances as science teaches; but there are concepts of atoms, molecules, and substances, and all contributions to chemistry are but contributions to language by which symbols that do not represent reality, but only concepts, are made more useful as linguistic devices. There is no such thing as motion; motion is but the product of thought. We think there is motion, but it has no objective reality, and contributions to dynamics are only contributions to language!

During the last decade Ladd has published a volume, titled *What is Reality?*, in which he sets forth in a masterly manner the concomitancy of the categories. In this great work he treats of the fundamental elements in the fallacies of materialism and idealism, and the metaphysicians of both schools must reckon with him before again stating their systems.

The stream of thought is a succession of judgments, and judgments are made of essentials; hence we cognize by essentials. Judgments are made instantaneously, hence our judgments are infinite, as that term is used in mathematics; they are so multitudinous that we cannot enumerate them in statable quantities. Judgments are repeated again and again and thus become habitual, when the objects of judgment are again presented or represented. These abstract judgments are concreted or integrated; for when a judgment is made of one essential, the others are implicated, posited, or presupposed; thus judgments become vicarious. If I judge that a body is one I implicate that it has extension, speed, persistence, and consciousness.

No particle or body can exist without all of its essentials, for they are concomitant. This fact is a refutation not only of materialism and idealism, but of all metaphysical systems.[1]

In metaphysic qualities are not discriminated from other categories. The same number is few or many from an ideal or an adopted standpoint of consideration. The sands of the lake are many compared with the sands of the pond, but the sands of the lake are few when compared with the sands of the sea. The stars of the Milky Way are many compared with the stars of Orion; the stars of the Milky Way are few compared with all the stars of the firmament. So forms are large or small from artificial standpoints. Structures are simple or complex in the same manner. Forces are strong or weak with different purposes in view; times are long for the same reason, and causes are trivial or potent.

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[1] For the demonstration of the concomitancy of essentials, see my volume *Truth and Error*.

Judgments are wise or unwise when the view comes, and the wisdom of yesterday is the folly of today. Men have distinguished but slowly between qualities and other categories, and there has always been a tendency to explain unknown categories as qualities, for often they have been dwelt upon before their corresponding categories were known. In the ordinary course of human reason the first incentive to an investigation of the other categories is derived from a knowledge of their qualities, and so long as they are unknown they are believed to be only qualities.

It is this characteristic of qualities that seems to give warrant to idealism. Qualities always change with the change in view, and they are ideal when we consider things with relation to purposes. You can always discover that idealists consider only qualities among the categories, and confuse all others with them. Even while I am writing this statement there comes to hand a new work on idealism, titled *The World and the Individual*, by Royce. On every page of this book he considers qualities and only qualities. On page 209 he says:

> Those other objects of common human interest are viewed, by common sense, namely, not as Independent Beings, which would retain their reality unaltered even if nobody ever were able to think of them, but rather as objects such that, while people can, and often do think of them, their own sole Being consists in their character as rendering such thoughts about themselves objectively valid for everybody concerned. Their whole *esse* then consists in their value as giving warrant and validity to the thoughts that refer to them. They are external to any particular ideas, yet they cannot be defined independently of all ideas.
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> Do you ask me to name such objects of ordinary conversation? I answer at once by asking whether the credit of a commercial house, the debts that a man owes, the present price of a given stock in the stock market, yes, the market price current of any given commodity; or, again, whether the rank of a given official, the social status of any member of the community, the marks received by a student at any examination; or, to pass to another field, whether this or that commercial partnership, or international treaty, or still once more, whether the British Constitution,—whether, I say, any or all of the objects thus named, will not be regarded, in ordinary conversation, as in some sense

real beings, facts possessed of a genuinely ontological character? One surely says: The debt exists; the credit is a fact; the constitution has objective Being. Yet none of these facts, prices, credits, debts, ranks, standings, marks, partnerships, Constitutions, are viewed as real independently of any and of all possible ideas that shall refer to them. The objects now under our notice have, moreover, like physical things, very various grades of supposed endurance and of recognized significance. Some vanish hourly. Others may outlast centuries. The prices vary from day to day; the credits may not survive the next panic; the Constitution may very slowly evolve for ages. None of these objects, moreover, can be called mere ideas inside of any man's head. None of them are arbitrary creations of definition. The individual may find them as stubborn facts as are material objects. The prices in the stock market may behave like irresistible physical forces. And yet none of these objects would continue to exist, as they are now supposed to exist, unless somebody frequently thought of them, recognized them, and agreed with his fellows about them. Their fashion of supposed Being is thus ordinarily conceived as at once ideal and extra-ideal. They are not "things in themselves," and they are not mere facts of private consciousness. You have to count upon them as objective. But if ideas vanished from the world, they would vanish also. They then are the objects of the relatively external meanings of ideas. Yet they are not wholly separable from internal meanings.

Well, all of these facts are examples of beings of which it seems easiest to say that they are real mainly in so far as they serve to give truth or validity to a certain group of assertions about each one of them.

Yes, if ideas were to vanish from the world, qualities would vanish also.

What, then, are qualities; and can we define them? Qualities are attributes of good and evil. This definition is perfect, for it is inclusive of all and exclusive of others. All that has been written in this series of articles is designed to set forth their nature. Qualities naturally fall into five groups: There are esthetic qualities, or qualities of pleasure and pain; there are industrial qualities, or qualities of welfare and illfare; there are institutional qualities, or qualities of morality and immorality; there are linguistic qualities, or qualities of truth and falsehood; there are sophiological qualities, or qualities of wisdom and folly.

Those attributes which we call qualities are always found in antithetic pairs. All human activities are performed for purposes, and these purposes are either good or evil; no purposes can be neutral. Hence we see that purposes play a role of transcendent importance *in human affairs.* Notwithstanding this, there are other categories of reality in the universe, but personal interest in qualities masks them from the consideration of the metaphysician.

If there has been one cause for the longevity of myths more potent than another, it has been the doctrine of phenomenon and noumenon as it is held in metaphysic. How often have men erred in judgment when brought to the test of action! What multitudes of judgments have proved to be erroneous by the test of experience through verification! When men contemplate the mistakes made in every hour of waking life; when men contemplate the hosts of erroneous notions that they have entertained, when they realize that the result of thought is mainly the reconstruction of notions, it is not strange that men should despair of all certitude and cry, "We know not reality, but only appearance!"

Aristotle formulated the laws of disputation as laws of thought itself, and so the logic of scholasticism is but the logic of controversy. When men compared theories of the universe, they found that any theory could be maintained with plausibility because they yet remained ignorant of the laws of verification; it was not strange that a sense of illusion seemed to pervade the universe. Thus the metaphysical doctrine of phenomenon and noumenon is seemingly confirmed.

SCIENCE

It would be a pleasing task to outline the history of science. Science is as old as error. Although human fallacies began with primordial man, knowledge also began with primordial man, and the two have grown together. Science has more and more prevailed, and error has more and more succumbed to its power. As the errors of animism, mythology, cosmology, and metaphysic have been overthrown, there are many who still entertain them, and scientific men have come to call all of these errors folklore, and folklore itself has come to be the subject-matter of science.

The study of folklore is the study of superstitions. Superstitions are opinions which stand over from a lower into a higher state of culture.

There are people who can move their ears at will; the lower animals can do this, but only a few human beings can wink their ears. Organs that are useful in lower species may remain in an imperfect and practically useless state in a more highly developed species; they are then called vestigial organs. As there are vestigial organs, so there are vestigial opinions. These vestigial opinions are commonly called superstitions. When we come to investigate vestigial opinions and treat them as objects of science, we no longer call them superstitions, but we call them folklore.

The science of folklore may be defined as the science of superstitions, or the science of vestigial opinions no longer held as valid. Yet such erroneous opinions that hold over from the days of greater ignorance to the era of modern scientific research are found to be of profound interest in the revelations which they make of the nature of superstitions themselves. We might neglect them, or seek to substitute for them valid opinions. However, science does not hesitate to investigate any question, and even the natural history of superstitions has come to be a profoundly interesting and instructive science.

Some years ago a movement was made in Europe and America to investigate superstitions themselves on the theory that they are valid. Societies were organized in London, Paris, Berlin, and Boston for the purpose of determining whether or not there is substantial truth in error itself. This is the function of the Societies for Psychical Research, the purpose of which is to discover the truth of dreams, the validity of necromancy, and the reality of ghosts. I have a suspicion that the Societies for Psychical Research are rather instrumental in increasing superstitions than in dispelling them, and that we reap the natural fruit of these researches in the increased prevalence of such abnormal cults and arts as christian science, mind-healing, spirit-rapping, and slate-juggling. Be this as it may, there is one result growing out of the modern Societies for Psychical Research which I hail with pleasure: In the transactions of these societies there is put on record a great body of superstitions, all of which are valuable material as folklore.

Remember it is the science of superstitions, and the science must deal with the fundamental errors of mankind (as the phenomena of nature have been interpreted by savage and barbaric peoples), and how these errors as vestigial phenomena have remained over in civilization and are still entertained. Of course the ignorant entertain them by wholesale; but it is not the ignorant alone who entertain superstitions. Superstitions are domiciled in many parlors, they are paraded on many platforms, they are worshipped in many temples, and they lurk even in scientific halls and appear in scientific publications and are taught by scientific men. There is much folklore in this world, and sometimes it may be found in strange company.

It is thus that the study of folklore reveals the origin and nature of superstitions and makes the grand scientific distinction between valid concepts and uncanny visions.

The habit of believing in the impossible, of expecting the absurd, and of attributing phenomena to the occult, gives rise to two classes of magical agencies which, from savagery to the highest stages of culture, have played important roles in the explanation of magic. These are the beliefs in mascots and taboos.

Those who dwell on the mysteries of life, especially as they are revealed in ecstasy, hypnotism, intoxication, and insanity, are forever looking for mascots or mysterious causes. Such occult agencies are sweet morsels to superstitious people, just as scientific men delight in the discovery of scientific facts. What a wonder it was to scientific men to discover that bones could be photographed through their covering of flesh! The discovery of the Röntgen rays was held to be so important that the discoverer was awarded a great meed of praise. But the potency of the left hind-foot of a graveyard rabbit plucked in the dark of the moon is held by superstitious people to be of more importance than the Röntgen rays. More people believe in mascots than believe in telephones, and those who believe in mascots believe that telephones are magical. In the same manner taboos perform wonderful magic feats in the notions of many persons. In savagery there are many taboos, and men must not do this thing nor that thing lest their enterprise should fail. Survival of taboos still exists; *e.g.*, thirteen persons must not sit at the table lest one should die. So mascots and taboos still have their influence in civilized society.

INSTRUCTION

Having set forth the nature of the opinions held by mankind in different stages of culture, and the way in which science supplants superstition through the agency of verification, it yet remains for us to characterize the agencies by which opinions are propagated. This gives rise to the fifth great system of arts, the last in the pentalogic series: the arts of *sophiology*. A brief characterization will be sufficient for our purposes.

Sophiology is the art of instruction.

NURTURE

It is found that in organized society man has developed five distinct agencies for instruction. In infancy parents instruct their children. As children advance in age, other members of the family take part in the work; and still as the child advances in years, his associations are enlarged and all of those persons who constitute his social environment take part. Instruction of this character is well recognized under the term *nurture*.

ORATORY

In tribal society an important agency of instruction is found in oratory. Every patriarch of a clan, every chief of a tribe, every shaman of a brotherhood, every chief of a confederacy, must be an instructor of his people. This instruction is necessarily conveyed by oratory; hence in tribal society a comparatively large number of persons are spokesmen or official orators. In the frequent assemblages of the people by clans, tribes, phratries, and confederacies abundant opportunity occurs for the exercise of this office, and when important matters are up for consideration in the council, every man has a right to a voice, and his influence in the tribe depends largely on his powers of persuasion as an orator. Oratory is therefore very highly developed in tribal society. At the dawn of ancient civilization the Greek philosophers employed this method of conveying instruction. In national society there is still opportunity for oratory in the more highly developed council of state.

There are other occasions for oratory. There still remains a field for the employment of oratory in religion, for the religious teacher must be an orator, and one day in the week is set apart for religious instruction. The method of instruction by this means has a long history, and through it mankind have received a large share of their instruction, although in modern times it has been employed chiefly in teaching morals.

EDUCATION

In modern society a distinct agency is organized for the instruction of youth in addition to those included under the terms nurture and oratory. This new instruction is *education*.

In the highest civilization the years of adolescence, and sometimes of early manhood, are consecrated to education, so that much of the time of individual life is occupied in this manner. A multiplicity of schools is organized, a host of teachers are employed, buildings and apparatus are used, so that the cost of education is rapidly advancing *pari passu* with the growing appreciation of its importance. The theory and art of education are undergoing rapid development. We may contemplate with surprise the development of manufacturing interests; we may gaze with wonder at the development of the agencies of transportation; we may consider with profound interest the development of commerce and the modern agencies upon which its highest stages depend, but the wonder of wonders is the development of modern agencies of education. As human muscle is supplanted by electricity, the tallow dips by the incandescent light, the coin by credit, so the text-book is supplanted by the library, the teacher's rod by the instructor's illumination, and the memorized word by the informing idea.

PUBLICATION

In early times many manuscripts were written and important ones were often copied, but altogether this method of multiplication was infrequent. A new civilization began with the events and discoveries that came upon the world about the time of the discovery of America; in this epoch the art of printing was invented, through which was developed a new system of instruction which has already become universal in civilized society and whose potency for progress can hardly be underestimated. This new system is publication. Books and periodicals constitute the fourth great agency of instruction.

RESEARCH

Research is the potent agency for the development of new opinions. Aristotle is credited with organizing research. Intermittent and feeble research extended from his time on until the epoch of modern civilization. The discovery of America signalizes the beginning of this epoch. Prior to this time research was dangerous; the propagation of new truth was held to be impiety to the gods, old opinions were held to be sacred, and terrible punishment was the reward of him who taught new truths to the world. Prior to this time even the discoveries in astronomy were held by men only in secret, and the flat earth with a revolving sun was the sacred opinion. When the New World was discovered it was so brilliant an example of the results of the belief in a scientific doctrine that science itself was exalted and the scientific man could hold up his head and walk the earth the peer of all men. Since that time research has been organized in many fields and hosts of men have become votaries to research, and now the fifth great sociologic agent is firmly established among the institutions of civilization.

We thus have Nurture, Oratory, Education, Publication, and Research as the five grand arts of Instruction.

THE CHUKCHI OF NORTHEASTERN ASIA

By WALDEMAR BOGORAS

Early history.—On some maps of the eighteenth century the country east of Chaun river and south of the Anadyr is not included in Asiatic Russia proper. This country, called Chukotskaya Zemlitsa ("Small Land of Chukchi") in old Siberian documents, was inhabited, according to the cartographers of the period, by a very fierce and warlike people who, when captured, took their own lives. The name of this people is Chukchi, and the correctness of the description is confirmed by the history of their relations with the Russians as well as by their present character.

Hostility between the Chukchi and the Russians began with their first contact in the middle of the seventeenth century. The Cossacks, who came from Kolyma and who in their contests with the Lamut, Yukagir, and Chuvanzi had been accustomed to easy victories and often to bloodless submission, met with most obdurate resistance; this was the more surprising as the people offering it had no social organization, but with remarkable unanimity of purpose followed the lead of their most experienced warriors.

In this struggle the Cossacks, despite the valor and wariness of their last leader, Major Pavlutsky, were finally utterly defeated. The Russians, in 1774, by orders of the government, destroyed one of their own outposts, Fort Anadyr, the supplies being sent to Kolymsk and Gishyginsk. Russian and Chukchi traditions abound in vivid pictures of this conflict, although naturally differing in their points of view. In the Russian account Pavlutsky was defeated because some of his followers, exhausted by the hardships of the campaign, did not appear in time to support him in the decisive battle. The leader of this force was one

Krivogornitzyn, and his last descendant, Mitrophan Krivogornitzyn, a blind beggar, lives in the village of Pokhodsk at the mouth of Kolyma river. I was there told by some old men that his sad fate was in punishment for the treachery of his forefather.

After repeatedly defeating the Cossacks, the Chukchi went to the Kolyma in baydaras and devastated the Russian villages. One of these settlements now bears the name Pogromnoye, from *pogrom*, "devastation"; while another is called Douvannoye, from *douvanit*, "to divide booty."

According to Chukchi tradition, Pavlutsky and his companions treated the inhabitants with incredible cruelty. They destroyed the entire population, cleaving men with axes and tearing women into halves by the feet; they drove away the reindeer herds or butchered them for food for their dogs, and carried off everything on which they could lay hands. The Chukchi camps nearest to the Russians were deserted, and the inhabitants, fleeing eastward, had decided to cross to America when the defeat of Pavlutsky changed the entire aspect of affairs.

Chukchi tradition likewise alludes to treason, but names as the traitor the son of the Chuvan woman with whom Pavlutsky lived. He was reared by his stepfather, but was secretly in communication with the Chukchi. The capture and horrible death of Pavlutsky are dramatically described. I will give only the close of the story from my collection of Chukchi folklore. There are several accounts of the final defeat of Pavlutsky, who is called Yakoúnnin, a name probably derived from Jacob, although the Christian name of Pavlutsky was Theodore. Even today many Russians assume names quite different from their Christian names. The reason for this custom is not given, but it is probably due to a desire to conceal their real names from sorcerers and other evil-doers. Following is the Chukchi account:

> "Yakoúnnin, you bad one, murderer!"—said the people to the captive; "we have no iron axes with which to cleave you as you have done our people, but we will in some way make you feel the pain of death!"

They stripped him of his armor and put on his head a reindeer bridle, with a long strap, and made him run with bare feet in a circle through the snow. When he grew tired they lashed him with reindeer-whips, every stroke drawing blood. Now, Yakoúnnin, the wicked murderer, was exhausted; his back was sorely lacerated and his tongue lolled. They brutally dragged him on until he fell, when they again lashed him with whips like women beating a tent cover. Yakoúnnin sprang to his feet and again ran in a circle, his tongue hanging to his navel. Again he fell, and could rise no more. Then they made a huge fire and roasted him alive. His flesh was cut off in thin slices, but the roasting was continued until Yakoúnnin died.

After the death of Pavlutsky intercourse with the Chukchi was broken off and was not renewed until 1789. The persuasions and gifts of Zashiversk were mainly instrumental in bringing this about.

The warlike spirit of the Chukchi was manifested not only against the Russians but against neighboring tribes, and especially against the Tánñit, which name, in the Chukchi language, designates the Koryaks as well as the Chuvanzi. Chukchi tradition is replete with accounts of these wars. The names of their most prominent heroes are still cherished, and many families boast of their descent from them. The principal leader in these hostilities was Lawtîlîwadlîn (" Man-beckoning-with-a-nod," or " Man-with-a-bear's-neck"); his fellow champions were Amloo, Bone-face, Chîmkîl, Elénnut, Ajñairhin, Tawe, Nankachhat, and others.

Lawtîlîwadlîn is described as a "destroyer of homes." "At the sound of his voice the courage of the strongest fails, and women slay their children that they may not fall into his hands. His arrows fall like rain." Another warrior, Elénnut, towers above the multitude like a fir; his hands reach to his knees; his fists are like two large wooden bowls. He runs in bounds through the deep snow. Another warrior, Nankachhat, has a lance with a blade a yard in length. When the ice on Nomwaan river breaks up, he stretches himself across the water and dams the ice, while caravans pass over his body, etc.

Recent habitat.—During the last half-century, thanks to their friendly intercourse with the Russians, the Chukchi have been much less warlike and brutal, and, barring a few exceptions, they have not been at war with their neighbors. The spread of the Chukchi during the last fifty years through the tundra, westward and northward, caused by the great increase in their herds, has also tended toward their civilization. On the whole the Chukchi are virtually newcomers in the Kolyma district, although formerly the Russians came in contact with them on that river. At the beginning of the nineteenth century Baranikha river, 200 miles east of the Kolyma, was the western limit of Chukchi territory. From the second quarter of the century the reindeer Chukchi, as their herds increased, extended their range on the west and north, occupying the entire territory as far as the wooded area, and either driving the original inhabitants, the Lamut, farther into the woods or settling side by side with them.

Barter.—With the renewal of intercourse with the Chukchi, trade revived. Near the confines of the Chukchi territory a fair was held each spring in a small fort, and trade soon reached the large sum of 200,000 rubles ($154,000) per year. From the first the high-priced American furs (foxes of the most valuable sort—"flame foxes," so called,—gray-neck foxes, beavers, and martens) were the most valuable imports. Russian goods were carried to the American coast and thence inland. The chief of these traders were the coast Chukchi, many of whom devoted their whole time to barter, going in the summer to America on their baydaras and in the winter journeying to the fair, with reindeers or dogs, on sledges. Trade is still carried on in this manner, and the costliest furs are taken by these merchants to the fairs of Anadyr and Anuy. Traffic was conducted between Asia and America before the coming of the Russians. The products of reindeer breeding were interchanged with those of maritime pursuits—ground-seal and walrus skins, and straps, seal-oil, whale-bone, etc. This traffic is now very considerable, for all the tribes of the coast require reindeer-skins as well as clothing of this material.

The wandering Chukchi tradesmen, in their half-fabulous tales, vividly describe the insatiable longing for tobacco manifested by the most distant tribes. A typical account follows:

> Far off, deep in the woods, live an invisible people—a specter folk—very rich in fox-skins. These people continually crave tobacco. Having reached their abiding place we cast toward the edge of the wood a small packet of tobacco which we always carry. Immediately the whole wood resounds with the cry "Tobacco! Tobacco!" — but nobody can be seen. Specters flit on all sides with foxes in their hands and with large bags. The foxes are seen, but the people are invisible. Then we fling toward the wood our bags of tobacco, and shortly afterward the bags are flung back filled with foxes; but still nobody can be seen.
>
> Farther on live men who at will dissever themselves. They stay among the trees on the shores of the lakes, cleft in halves, but at the slightest rustling their parts come together and they dive into the water.
>
> They, too, have a longing for tobacco, and exchange large fish and otters for it. Then again in the woods exist men not larger than the forearm of a man. They subsist on trees and buy tobacco with the skins of the lynx and the muskrat. Then again there are shaggy people with the body of a polar bear but with the face of a man. These are the best of all, since for a little snuff from a tobacco pipe no larger than a nail, they will give a marten. And all men of that country, large and small, covet tobacco through all their lives.

During the last twenty-five years trade by American whalers in Asia and America has reduced the importation of American furs, the few that are now brought in going to Anadyr. Trade with the Chukchi on the Kolyma is now limited to the exchange of Russian tea, tobacco, and hardware for the products of local reindeer-breeding and for the furs obtained by the reindeer Chukchi of Kolyma. The yearly traffic at the Anuy spring fair now aggregates only 15,000 rubles.

Tribute to Russia.—During the eighteenth century many attempts were made to levy a tax on the Chukchi, in return for which the government agents have freely offered gifts which far exceeded in cost the whole amount of this *yassak*. About the middle of the nineteenth century some 150 men paid tribute, consisting of a red or white fox-skin, each receiving in exchange tobacco and utensils of at least twice its value. In 1870, Baron von Maydell, governor of the Kolyma district, induced some of the reindeer Chukchi near the Kolyma to forego their importunities for gifts, in consequence of which the annual tribute was reduced to one ruble per adult man, amounting to 247 rubles from a population of 3000.

The other half of the reindeer Chukchi and the coast people pay no tribute, and are independent of their western neighbors. From the first the Russian authorities sought reliable and prominent men whom they could make chiefs; but their efforts were generally fruitless, as the Chukchi would not recognize such leaders. Old deeds in the archives of Kolyma mention several chieftains of this sort to whom their compatriots mockingly gave the surname Yī'ñītcîn, the "Long-nosed," i. e., those who poked their noses into affairs without authority.

Baron von Maydell, when imposing tribute on the reindeer Chukchi, conceived the idea of erecting a hierarchy, the head of which should assume the title of the so-called chief *toyon*[1] of the reindeer Chukchi and be known to the Russians as the Chukchi "king." This idea is now a subject of ridicule. In some years eight chieftains are elected; in others only three or four. Many people assessed by Maydell have since died, and their children refuse to pay the tribute. Since the *yassak* is very small, and inasmuch as the chieftains are usually selected by the authorities from the owners of the largest flocks, these chiefs ungrudgingly pay the tribute of those who refuse. Most of the money is paid by the men who live on the great tundra west of the Kolyma and in the mountains south of Omolon river, for this area has been occupied by Chukchi only a few years, and they consider the payment to be a tribute for their lands.

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[1] A Turkish word for "lord" used throughout Siberia for the native chiefs.

Tribal divisions.—The Chukchi tribe may be divided into two groups — the reindeer Chukchi and the maritime Chukchi — together numbering some 15,000 according to the latest census by Mr Gondatti and myself. The Kolyma district contains not more than 3000 Chukchi, all of them possessing reindeer herds. The maritime Chukchi inhabit the Arctic coast from Cape Erri to East cape; on the Pacific coast they are intermixed with the Asiatic Eskimo.

Both branches of the Chukchi speak the same language, and although living quite differently are so intermixed as to be practically one people. Nevertheless, their folklore furnishes reason for supposing the existence of two tribal sources, unlike both in physical type and in culture, and which are represented as hostile to each other. One of the tribal nuclei appear to have been wanderers on the tundra and breeders of reindeer; the other settled on the coast which they navigated in long canoes quite unknown to the inlanders.

The Russian name Chukchi, or Chukchee, is derived from the Chukchi word *Chd́wtcy*, which signifies "rich in reindeers." The reindeer people assumed this name in contradistinction to the coast dwellers, who are called Añkalît ("Sea people"). Those who go back and forth between the coast villages and the camps of the reindeer-breeders are commonly called Kavrálît ("Rangers"). They are numerous and maintain control of the trade. The Russians generally call them Cape Chukchi, although most of them come from villages nearer than East cape. Usually the Chukchi call themselves simply Oráwêtlat ("Men"), or Lîe-oráwêtlat ("Genuine men"), regarding all foreigners to be like devils (*kê′lat*).

Food.—The maritime Chukchi subsist by hunting sea-animals and by fishing. Notwithstanding the abundance of game and fish, their sustenance is far from assured, since they have to provide for their dogs, on which they depend for transportation, the same food as for themselves. A full team of twelve dogs will consume twice as much food as an ordinary human family; besides, several puppies must be raised to take the place of the old or worn-out dogs. In addition to the food, there must also be obtained fuel for cooking it. This must be either seal or whale blubber, since all along the coast between Cape Erri and East cape driftwood is very scarce, and there is no standing timber. When the hunt has been successful, the maritime inhabitants, in the words of an ancient tale, "eat so much blubber that it trickles down both sides of their faces"; but when no game is taken the people often starve to death. The tales of the maritime Chukchi contain many direful details of such famines, which occur usually during heavy snowstorms when every living thing is deeply buried. Many of these tales relate how the inhabitants, having plenty when a storm began, afterward became short of provisions, and not being able to replenish the supply, famished. They first ate their dogs, then the skins, and finally began to gnaw their own hands.

The reindeer.—The greater part of the Chukchi gain their livelihood by reindeer-breeding, by which means existence is far less hazardous. There are many peculiarities of reindeer-breeding among the Chukchi not found elsewhere. Those about the dividing line of the continents have been more successful in reindeer-breeding, in point of numbers, than in all Asia; but in taming the reindeer they are far less successful than their neighbors, and their herds can scarcely be called domestic animals, since they are very shy and on the slightest provocation become as wild as any untamed beasts. Their hedging of half-wild reindeer is the same as that adopted preliminary to breeding any kind of cattle. The Chukchi herdsman must give his entire attention to keeping his flocks together. If he should become overworked and relax his attention, the flock will go astray, and after a few days of independence they become lost forever. There have been cases in which herdsmen fell asleep near their herds and on awaking could find no trace of them. I was informed of a family on

Chaun river, who in a single summer lost nearly all their animals, and in despair took their own lives.

In the summer of 1895, on the shore of the small river Molónda, in the Stanovoi mountains, we tended the herd of Sava, one of the wealthiest young reindeer herdsmen in that section. The animals were very restless; nearly every week half the flock would wander off, usually to the opposite side of the river. We could not follow them thither as the Molónda has a swift current, and at that time the stream was very high. The Lamut swam to the opposite bank on the back of a tall, gaunt courser, but when one of our herders, E'tuwhi, a heavy-weight, tried to follow, he was thrown in midstream and saved only with difficulty.

Every summer the reindeer Chukchi, in order that their herds may not become infested with insects, cross the tundra to the coast, where the ice-floes, drifted thither by the north winds, make the air cool. Others go inland to the glaciers near the sources of the small rivers. Early in autumn most of the herdsmen return with their herds to the shelter of the woods. The extent of these wanderings is not very great—only from 150 to 200 miles—but the Chukchi travel slowly and make frequent stops, so that these trips consume nearly nine months of the year. In summer all travel is suspended, the Chukchi reindeer being too small and weak to be used; therefore, as the large herds require frequent change of pasture, the herdsmen, as soon as the camp is settled for the season and a number of bucks sufficient for the needs of the family have been killed, drive their herds to pasture and wander with the reindeer for three months, without huts or other shelter, carrying their provisions and spare clothing on their backs, and living practically the same life as their animals. Every two or three weeks they return to their families to see that they are not in need of food, and in case of want they will carry to camp, on their own shoulders, the freshly-slaughtered animals. They could not drive their herds close to the camp in summer, since the neighboring pasture lands must be kept for the August holidays. These cover several days, when many animals are slain, and the winter clothing is made from the reindeer-skins. Sometimes in midsummer, when the herds wander far, the people in camp are obliged to live for several days on berries, roots, leaves, and the like, mixed with stale reindeer blood, and often suffer hunger. The herdsmen kill few animals for their own use, as it is difficult to transport the meat; besides, in early summer the skins are too thin and full of holes to be of service.

Every summer a hoof-swelling malady ravages the flocks, and this is another reason why the herdsmen, knowing their herds will be decimated, are loath to slaughter them. To appease their hunger they suck the milk from the cows, or chip off a part of the new antlers of an old, heavy-headed buck, eating the thick gristle full of blood and covered with hair, which must be singed. Notwithstanding their scant diet, the herdsmen must exercise the utmost vigilance, sleeping but little for days at a time, as the reindeer-fly makes the reindeer restless and persistent in their efforts to get away.

During the dry, hot summer the strongest men become thin and weak; their eyes are inflamed, and the skin of their faces is burned almost like leather. The Chukchi know of no remedy for the maladies with which the reindeer become afflicted. They skin the carcasses and carry the flesh to camp when not too far. By reason of the scarcity of wood on the tundra, they build no pens or fences for their herds, but have to run about constantly after the fashion of a common shepherd dog.

On the whole their half-wild animals make but indifferent teams. Those bred by the Lamut usually command a double price, which is willingly paid by the Chukchi. If the reindeer herds of the Chukchi are increasing, it is due to constant exertion in keeping them together and to their frugality in the use of the flesh. The Chukchi housewife knows better than the women of the neighboring tribes how to obtain from a carcass the most nutritious parts. The flesh and blood, the rims of the horns and hoofs, the gristle of the ears and nostrils are all consumed, raw or cooked. The half-digested moss taken from the paunch is cooked with fat and roots as a porridge; the bones are boiled to extract the marrow, and the remainder is used for feeding the dogs.

The Lamut hunters and the Russo-Yukagir fishermen on the Kolyma are not so provident. When they have plenty of food they waste much of it and indulge in excesses with no heed for the future. The Chukchi pabulum also includes many edible roots, leaves, and vegetable products not raised by neighboring tribes. I once met in the camp of Kêñukêda, a wealthy reindeer-breeder, some Russian fishermen who had come from a neighboring village to buy reindeer. The host had just returned from his herd, and instead of meat he was given to eat porridge made from willow-root bark cooked with sour liver from the summer supplies. The Russians regarded the repast with obvious disgust. At last one of them sneered: "Ah, Kêñukêda, you must have a capacious throat; even the wood slips down!"

"Aye!" answered Kêñukêda, quite unaffectedly, "my throat is indeed large, but I don't need to come to you for food!"

Physical characteristics.—Regarding the physical type of the Chukchi, without the presentation of anthropometric data at this time, it is possible to make only the following general remarks:

The Chukchi, as a rule, are tall and well built, especially when compared with their nearest neighbors, the lean and under-sized Lamut. Their cheekbones are much less prominent than those of the Tungus or Yakut, and the nose is smaller. Their eyes are brown in color, straight, and are frequently as large as those of the white race. Their hair is black and sometimes wavy, or indeed curly, a characteristic which I never found among the Lamut, and only among the Yakut of pure blood. It becomes gray much later in life than among the Caucasians. The beard is scanty, but is seen more frequently than among the Lamut or the Yakut. The eyebrows are often thick and shaggy, especially among the old men.

In this connection I would say that one of the requisites for beauty in a woman is heavy eyebrows.

The gray, sallow color of the skin of the face, common among the Lamut and Yukagir, is seldom seen among the Chukchi. This may be due to the superior diet of the latter. The color of the face is bronze, with intermediate tints varying from brick-red to blood-red. The ideal of beauty in both males and females requires the face to be as "red as blood, burning like fire." The color of the skin of the body is generally scarcely distinguishable from that of the Caucasian; however, there are numerous cases of brown or even of dark bronze skins.

Many Chukchi faces are rather clumsy in outline, with forehead low and straight, skull flattened, lower jaw massive, and the lower part of the face disproportionately large and strong; therefore a handsome head is frequently compared to a round, mossy hillock. One of the marks of superiority is the ability to eat quickly. "When the young men eat quickly the old men look on with pleasure," says the proverb. Faces strongly Mongol in outline are more frequent among the women, though many of them are as fair and well shaped as any woman of the white race.

Health. — The Chukchi are the healthiest of the tribes of the Kolyma country. Their women are free from that form of arctic hysteria which besets almost all Yukagir and Lamut women. Of contagious diseases, now, as formerly, the most dreaded is smallpox, which in 1884 destroyed more than one-third of the population. Some forty years ago syphilis, too, was much dreaded. The Chukchi regard it as indigenous, though its name, ***átal-vaírghin***, suggests the name of a tribe (*Átal*, Russian, Chuvanzi) who were mediators between the Russians and the Chukchi. However this may be, one afflicted with syphilis was regarded as an outcast. At home he was provided with bedding of his own, a separate dish and bowl, and was kept aloof lest others should contract the disease. Nowadays, since the decrease of the disease, these precautions are not maintained.

Another contagious disease, somewhat akin to influenza, now and then spreads through the country, from the Russian villages eastward, carrying away scores.

In spite of all this the reindeer Chukchi have increased steadily during the last half-century. Their families are large, one mother often having as many as ten children. The men live to old age, and often a white-haired man has a young bride with whom he rears a large family. These wild tribes are like squirrels in the wood or foxes on the tundra; they thrive and increase until ravaged by hunger or disease.

Mental character.—Opinions as to the mental character of the Chukchi vary according to the personality of the observer. To me their most conspicuous trait is their irascibility, of which they themselves are not unconscious.

" I am a tundra wanderer ! " one of my Chukchi acquaintances, named Nhîrô'n, would say to me. " My anger rises suddenly ; it comes and goes of its own will."

The Chukchi in anger growls and shows his teeth, and even threateningly bites his sleeve or the handle of his knife, as if defying his foe. Some of them, when angered, shed tears and tear their hair like unruly children, and, when unable to take revenge, even commit suicide. They resent any assertion of authority against their will. This aversion to submission constantly breaks out in the family and among the clan-ties — even wives against their husbands and children against their parents. In the time of the wars with the Russians it impelled captives to take their own lives and made the free willing, in case of defeat, to leave their own country and emigrate to America.

Sophiology. — The Chukchi have a wealth of folklore and tradition, some of their tales being so long as to consume a whole night in the telling. In their own way they are eloquent. The character of their folklore is quite different from that of some of the Ural-Altaic people, and, in common with the folklore of the Yukagir, Kamchadal, and probably also the Koryak, presents many points of resemblance to that of North America, especially of the North Pacific coast tribes. A collection of about one hundred and ninety of my Chukchi tales is now being printed by the Academy of Sciences of St Petersburg, hence I can only barely allude to the subject here. For instance, in the cosmogonic legends the raven acts the same part as in North American lore. He is the creator of the world and of man; he brings light — the sun, the moon, and the stars, — he makes lakes and rivers, and inhabits the earth with animals, etc. After his work is done he becomes a thunder-bird and lives in the sky surrounded by clouds.

Some of the Eskimo tales in Rink's collection are also known among the Chukchi. This is not surprising, since the latter are fond of the tales of other people, and have appropriated many Russian stories, adapting them, not without skill, to their own mode of life. I have listened to tales purporting to have been of American origin, as if they had been learned from American whalers, although I could not have told as much from their theme

Like many primitive tribes, the Chukchi have developed a system of rites much more fully than that of creeds. The holidays of the reindeer Chukchi form a complete cycle, beginning with the autumnal feast of "slaying the thin-haired reindeer" and ending late in the spring with the "feast of antlers." All these feasts are accompanied with offerings in the form of sacrifice of reindeer, dogs, and small symbolic figures made of tallow, pounded meat, ground edible leaves, and even of snow and clay, all of which are regarded as substitutes for the real animal. Besides fat, flesh, and blood in the uncooked state, women prepare for sacrifice a porridge of blood mixed with fat and various edible roots. This is one of the most savory dishes prepared by the Chukchi.

In addition to the above, the following rites and sacrifices are included in the cycle:

1. *Enankadẃkwurghîn*, feeding (of the hearth).

2. *Enattcî'îrghîn*, a ceremony of thanksgiving over the larger animals killed in hunting.

3. *Enapyerdtīrghîn*, commemorative of the dead.

4. Rites performed in accordance with a vow. Of these there are two groups: (a) *Mnhĕ'ĭrghîn*, ceremonials by vow; (b) *Erdîrghîn*, racing for a prize.

The last two classes are the most important, since they are regarded as a safeguard against supernatural evils, and are arranged by promise, or under the influence of some dream, or at the behest of a shaman having the gift of prophecy. *Mnhĕ'îrghîn* is a particular kind of sacrifice, accompanied by drumming, ritualistic singing, dancing, etc. Sledge-racing is likewise attended with sacrifices and also has a ritualistic meaning. Racing is a social festival which attracts the whole population of the nearest camps, and is accompanied with foot-running for prizes, wrestling, and other feats.

Mortuary customs.—The mortuary rites of the Chukchi are of great interest. In disposing of their dead they either burn them or leave them in the open field wrapped in large slices of reindeer flesh. The manner is regulated by family tradition, which descends from father to son. Soon after death the body is stripped, placed in the inner sleeping-room, and carefully covered with reindeer-skins, since it is thought to be a sin "to show any part of the corpse to the sun or to a strange eye." One of the nearest relations of the deceased must pass the first night in the sleeping-room, watching the body. In the morning four other relations come to dress, before doing which they share with the dead the last meal. It was once my lot to share a meal of this sort in a room so narrow that we had scarcely room to sit with the corpse. For lack of space we put our dinner-board on the dead man, placing thereon our cups, teapots, and trays laden with meat. We sat leaning our elbows over the body, and since I was at the upper end, my elbow was directly over the head. In the board against the mouth they cut a hole, and on me devolved the duty of feeding the dead, pouring hot tea into the hole and slipping through it morsels of tallow. When the meal was finished, all the men stripped themselves to their inner skin shirt; then raising the corpse slightly, they thrust their bare feet under the nude body, and, resting it on their crossed legs, began to put on it new clothes made for the purpose. When the corpse was dressed, the face was covered with the hood of the outer cloak which, tied with a freshly-cut thong, was wound around the whole body from the head downward. They then pushed the corpse out to begin the divination.

This divination is performed by near relations of the deceased with the aid of the staff or of the crooked wand of horn used for beating the snow from fur clothing. The staff or wand is tied to the thong binding the head, and the divinator, holding with his hands the opposite point, asks a question and strives to lift the body. If the answer is in the negative, the corpse is supposed not to allow its head to be lifted; if, on the contrary, the answer is an affirmative one, the head is lifted without effort. In this manner the dead is questioned as to the spot where it desires to be placed, about the leader of the funeral procession, the reindeer-team for its funeral sledge, etc. In the same way it is questioned about the future of those living, about the diseases likely to attack them, and as to their success in hunting, trading, etc. After the divination the corpse is tied lengthwise on the sledge, a reindeer team is harnessed, and the leader sits astride the body, taking the reins in his hands.

The Chukchi sledge must be used with the legs dangling on both sides. When the place of deposit is reached the reindeer are slain. Some of the followers untie the corpse and place it on the spot designated, while others cut off the reindeer flesh in thin, broad slices. When enough flesh has been cut off, they begin to cut the clothes of the dead, exchanging for every piece a slice of flesh until the body is entirely covered with it. Then the nearest kinsman cuts the throat and opens the breast in order to lay bare a part of the heart and the liver. This operation is performed with gloved hands, since the dead body is reputed to be unclean and must not be touched with bare hands. The corpse is then left to the ravages of wolves and foxes; and the sooner it is consumed the better it is supposed to be for those living.

When burning is resorted to the corpse need not be covered with reindeer flesh, but is put on the pile with the clothes on and tied around with the thong. On the tundra, when there is no standing timber within reach and driftwood is scarce, the sledges and tent-poles are sometimes cut up for the pyre.

Divination.—Divination for deciding as to the moving of a camp and herd, and for undertaking journeys, is frequently effected by a burnt reindeer shoulder-blade, or by suspending the thing most often used. When the object hung is heavy, it is let down on the ground and the answers of the oracle are interpreted as in the ceremony for the dead: when the answer is negative, the article cannot be lifted; when it is in the affirmative, it is easily lifted. In divination with a light object it is held up, and when the article remains still the answer is in the negative, but should it swing, the answer is affirmative.

A feature of all rites is the so-called *ĕlŏ́'tko-vdĭrghĭn* ("the exercise on the drum"), which is in the nature of shamanistic practice and gives weight to the idea that this or that individual has shamanistic power. Every one, male and female alike, has the right, and on some holidays is duty bound to share in this exercise on the drum. The exercises are accompanied with the ritual dance and the singing of airs, some of which are inherited while others are composed for the occasion or improvised.

Sacred objects.—The idea of sacredness attached to the hearth and to many household implements, such as wooden fire-making tools rudely carved in the form of idols (*ghĭ'rghir*), and to small wooden amulets (*tdiñīkwut*), originated in their system of rites. Family drums are also sacred; they descend by inheritance and must not be given to strangers; they are supposed to protect the well-being of the family, and play a part in all rites and on all holidays. In the principal yearly feast—the slaying of the thin-haired reindeer—the ceremony is accompanied by anointing the reindeer with the blood of sacrifice. In this ceremony all the family paint their faces with certain inherited signs which are different for each family.

Taboo.—Every family is hampered by prohibitions, the most important being the taboo of interchange of fire (even of partly burnt fuel), which causes much inconvenience on the cold and timberless tundra. It is worthy of note, however, that no such taboo is recognized in their relations with neighboring peoples. The fire of a Russian neighbor or guest, for instance, may be borrowed by any Chukchi without fear. In personal intercourse, such as lighting a pipe, a Chukchi may freely use fire obtained from matches or by flint-and-steel. Only the sacred household fire, obtained from wooden fire-making implements, and which is indispensable at feasts and on holidays, must be absolutely free from contact with another fire derived from similar means.

Generally the fire of a strange family is regarded as infectious and as harboring evil spirits. Fear of pollution extends also to all objects belonging to a strange hearth, to the skins of the tent and the sleeping-room, and even to the keepers and worshippers of strange penates. The Chukchi from far inland, who travel but little, when they come to a strange territory fear to sleep in tents or to eat meat cooked on a strange fire, preferring to sleep in the open air and to subsist on their own scant food supply. On the other hand, an unknown traveler, coming unexpectedly to a Chukchi camp, can hardly gain admittance to a tent, as I myself have experienced.

Animism and spiritism.—Many details of the rites and feasts vary in different families, and are performed with the utmost care and secrecy. The animistic conception of the outer world is generally recognized. All objects retaining their natural properties and much of their natural shape, but assuming also the shape of human beings, are thought to possess animate power. Thus the personified "People of Wood" (*Úttî-rĕ'mkîn*) fear the fire, for it could burn them; while the " Tallow People " live on the bottom of the stone lamp, etc. This concept coincides with the Yukagir notion of indwelling spirits (" owners "), resembling human beings, filling the outer world. Such, for example, are the owners of the woods, the rivers, the mountains, etc.

The conception of evil spirits (*kê'lat*), wandering unseen about the earth, is also extensively developed; all misfortunes and maladies, even death, are ascribed to them. They come from under the ground, or from the extreme limits of the Chukchi country, for the sole purpose of harming men, and having accomplished their purpose they pass on. Sacrifices are rarely made to them, except by wicked shamans. Protection against these evil spirits can be gained only from right-minded shamans, who can foretell their attacks and advise measures for rendering them ineffective.

The *kê'lat*, when attacking man, first tries to get his soul and eat it. Every man has from five to six souls, or even more. These souls (*uvī'rīt*) are very small—not larger than a gnat. Everybody can lose one or even two of the *uvī'rīt* without endangering his health, but if he loses too many, illness ensues. On the other hand the shaman can cure a man who has lost all his souls by blowing into him some part of his own spirit or by replacing the soul with any of the *kê'lat* dependent on himself.

The conception of a general divine force is very indefinite and is termed *Nhárhînên* (World), *Uê'ubechu-wáîrghîn* (Merciful Being), *Tînantúmghî* (Creator), etc. The Creator is represented as living on top of the sky. Some traditions give him the name of the " Owner-of-the-star-with-the-stuck-snake " (*Unp-ê'ñêr*), a term applied generally thoughout Asia to the polar star, signifying that it is fixed and in the middle of the sky.

Shamanism.—Sexual transformation.—Shamanistic powers are conferred at maturity. A young man, not having before shown any sign of singularity, suddenly becomes pensive; he may pass days and nights in the open air far from home, or, on the contrary, he may sleep in the sleeping-room without ever going out. He refuses food and intercourse with men, and answers no questions. This critical condition, believed to be caused by the onset of the spirits on their chosen man, often ends in the sickness or death of the man " doomed to being shaman." The only means to be resorted to for recovery are drum-practice, performed by the " new-inspired " uninterruptedly for several weeks, together with singing and attempts at ventriloquism.

Then the young man doomed to sexual transformation receives a message to that effect from his spirits, and must at once don women's clothes, acquire a woman's voice, learn to perform women's work, and forget his former masculine knowledge. He must become very bashful, and, like a young girl, ashamed to look a stranger in the face. After this transformation he, or "she," looks about for a lover, in which she is aided by her protecting spirits, who cause the hearts of the young men to be drawn to her and inspire them with the passion of love. After a while the transformed is married, and lives during the rest of her life in the wedded state, performing of her own accord the duties of housewife. Such full transformations are not numerous. In a tribe of 2000 men I heard of only five cases. Instances of partial transformation, whereby the man, assuming female clothing and speech still can have a wife and beget children, are more numerous. Instances of the transformation of women into men are more rare.

All other Chukchi shamans may be divided into three groups. The first includes ventriloquists, who perform many tricks similar to those of spiritism. Implicit faith is not placed in all their arts, many of which are looked upon as mere amusements. The second group, the medicine-men (" knowing ones "), seek the destruction of the evil spell, or, on the contrary, its consummation. The third group, consisting of the prophets, occupy themselves with divination. These groups, however, are not clearly defined, for a shaman skilled in the practices of one has generally a knowledge of the others.

Chukchi shamans use the common family drum and wear ordinary clothes, sometimes crudely ornamented along the skirt and around the wrists with many amulets and thickly-sewn fringe. They perform their tasks in utter darkness, in the inner sleeping-room and in an almost naked condition. The shaman sits in the place of honor in the left inner corner, but is cramped for space since the room is small. The performance consists of a series of all sorts of sounds, the performer, by deflecting the sound, producing strange effects with his drum, and throwing his voice, with varying force, in all directions. The sounds rush through the room like a storm. The spirits talk on all sides; they quarrel among themselves and attack the shaman and the assistants. Once in a performance of this sort, Kôpô'whê, the celebrated shaman of Anuy river, made the spirits, at my request, speak close to my ear, and the illusion was so complete that I involuntarily held up my hand to catch the voice. These spirits, coming at the call of shamans, have the name of *kĕ'lat*, but are not the same as the evil *kĕ'lat*—the malady-makers. These *kĕ'lat* are not harmful; they represent objects in nature, taking their names, as *Īlwî'lu-kĕ'la* (Wild-reindeer spirit), *Nhaw-ri'rka-kĕ'la* (She-walrus spirit), *Chĕ'yvulêgay* (the Walking One, i. e., the Bear), *Iwchuwghī* (the Long One, i. e., the Needle), *Pílvî'nte-pndwḳwun* (the File), etc.

The shamanistic songs are varied and have some beauty, though they sound oddly to a European. A shaman will sing and drum for several hours without sign of fatigue, as if he were buoyed up by the spirits who sang and performed in his stead.

Astronomic lore.—Many tales are associated with the Chukchi constellations: Arcturus and Vega are named "two brother heads," the foremost head and the hindmost head. They wander over the sky, following each other with a long row of loaded sledges. The foremost head is called "the herd of the stars" and "the herd of the upper reindeer flocks." Orion is an archer (*Chultĕ'nnin*), aiming with his bow at a group of women

(Pleiads), each of whom refuses to marry him, on account of the size of his virile member, which is represented by three stars extending downward. Chultê'nnin has another wife (Leo), but they quarreled and she struck him with a tailoring board, causing his back to become crooked; therefore he repulsed the woman, who, being tired, fell asleep in the middle of the sky, her head resting on her right sleeve. Aldebaran is an arrow of the Chultê'nnin stuck in the bog represented by numerous small stars. The Milky Way is a river with sandy banks and many isles; in the middle of it stand five wild reindeer bucks (Cassiopeia). Ursa Major represents six warriors armed with slings, the seventh double star being a gray fox gnawing a pair of reindeer antlers. Corona Borealis is a polar-bear's paw. Shooting stars are said to slide down ice-hills. Comets are called "smoking stars," the smoke indicating that much cooking is being done.

The Chukchi have eight seasons in their year, twenty points of the compass, and three shortest days in winter.

Social organization.—Among these people the strongest social relation is the family tie, which is broadened to include the clan. Nearest male relations form a union pledged to assist one another. This union is cemented by the community of fire, by consanguinity (which is admitted for the male side), by the identity of the signs painted on the face with the blood of sacrifice, and by hereditary ritual songs.

Members of the same kin roam over the same territory and maintain intercourse between themselves. If one loses his herd, richer kinsmen will replenish his stock. Marriages are usually restricted to their own kindred. Journeys to Russian block-houses or trips to the seaboard for purposes of trade are undertaken by one or more members, who take with them skins and furs for which they trade tobacco, hardware, walrus skins, and ground-seal thongs. These articles are divided among the kindred according to the respective number of skins traded, but whenever any one is without tobacco or thongs, he can take from those who have them. An offense committed against any member of the kindred is speedily avenged. A Chukchi proverb says: "A man rich in brothers is prone to violence; the brotherless is timid." However, this close tie is kept up only by cousins; the third generation is bound much more loosely, and after removal to another territory the bond is soon forgotten. The hereditary songs change so much as to be finally unrecognizable; the "halves of the same fire," burning apart and in a different environment become estranged, having to feed on different fuel, and forming a "smell and a breath of their own."

The union of Chukchi kinsfolk has no chiefs, no settled meetings, nor any organization. The kinsmen usually meet at the reindeer races, which are arranged at brief intervals by each man in turn. If there be some question of common concern it is talked over, although it is not always settled.

Marriage.—Marriage is contracted in different ways. Unions of couples closely related by blood are very common, and the bond is regarded as stronger than when the pair are not consanguineally related. In such cases no payment is made for the bride, but the family of the latter have a right to expect an equivalent from the groom's family, should they need it later. Children are often reared together with a view of future marriage. They sleep together from the beginning, and the marriage is consummated on the first impulse of nature, or even before maturity of either party. Such marriages are considered to be the strongest.

Another form of marriage is concluded between persons belonging to different family groups. In former times such a marriage required one of the parties to enter the family of the other, leaving forever his own kindred. Latterly, the length of this desertion has been restricted to one or two years, during which time the bridegroom must serve the family of the bride, his service being counted as ransom paid for the woman. A young man thus serving his father-in-law, as Jacob served Laban, has to perform all kinds of rough and hard work, and is usually tested by various trials before the family of the bride allows him to lead her away. Rich families who, having many young women whom they are unwilling to give to strangers, generally select poor young men. These, having stood the test, are admitted to the bride and become members of the family by the performance of certain rites.

These latter forms of marriage are not very binding. The parents and brothers of the woman given away to the stranger reserve the right to take her back even after the lapse of years. I knew of a Chukchi, named Nhîrô′n, who was young but poor and profligate, and who gave his sister to another Chukchi, Ankánukwat, son of Táto. Instead of the required time of service, the bridegroom came to his brother-in-law, bringing his own large flock. He lived with his brother-in-law two years, during which time Nhîrô′n and his wife fed from the flock and squandered all that he could obtain, selling young and old bucks to the Russians, or gambling them away. At the end of the second year, Ankánukwat, whose patience was nearly exhausted, wandered off. For two years more Nhîrô′n profited from the same source, taking now a team, now skins to sell, or young animals to slaughter. Finally, Ankánukwat utterly lost patience and refused his brother-in-law's demands, whereupon the latter, having been playing cards for three days, went at once to Ankánukwat's camp and took his sister away, though she had been Ankánukwat's wife for four years. The husband did not care to quarrel, especially as he had no children; but pitying his wife, he followed her to Nhîrô′n's place and stayed there a week or two, hoping Nhîrô′n would relent. The latter, however, requested Ankánukwat to rejoin his camp, and not knowing what to do, Ankánukwat took counsel of his father. Meanwhile, Nhîrô′n took a hand at cards with a friend, and the divorce contest came to an unexpected conclusion. One of Nhîrô′n's neighbors, Mēwēt, having an old score to settle, came to the camp in Nhîrô′n's absence, and led the young woman, nothing loath, to his own home. Nhîrô′n was so enraged when he learned of this that he immediately, at night and in a severe snow-storm, sought an encounter with his enemy. Two months later, when I was again in the vicinity, I found him with his family living at his new brother-in-law's and dissipating his large flock as well.

In the case of accepting a poor young man into the family, there have been instances where the father-in-law, becoming displeased, has suddenly sent the son away, although he may have been in the enjoyment of his nuptial rights for several years. In one such case the young man, rather than leave his wife, took both her life and his own.

Marriage by interchange is observed mostly between first and second cousins. Males entering into this bond acquire the mutual right to the wives of one another, a right which can be claimed at every meeting. Nowadays marriage by interchange can be contracted between unrelated parties — even with people of foreign tribes with whom close friendship has sprung up. A bachelor and a widower living in the same camp with a married man can form a like contract. This style of marriage is only a system of polyandry. Sometimes more than ten people may be affected by marriage through interchange within one group, although three or four are regarded as sufficient. Women generally are not averse to the custom; even Russian women married to the Chukchi of the tundra submit to the interchange method without protest, while, on the contrary, Chukchi women have been known to take their lives rather than submit to the demands of other men, even with their husbands' consent.

Chastity is not highly regarded. The Chukchi language has no distinctive term for "maiden," the word *yánvînháyê*, which is usually employed, referring to any woman without a husband, including widows and divorced women.

Polygamy is common, but the polygamist is generally contented with two wives, although the Chukchi chief Ēyhēlī, previously referred to, had four living wives besides four who were deceased. A rich Chukchi on Anuy river had seven wives; and other examples might be mentioned. The first wife is held in greater esteem than the others and is termed the "elder wife" (*pēnïn nhēw*). The second wife can expect to win the favor of her husband only after she has given him several healthy children.

The reasons for polygamy differ in different cases. When an elder wife is childless, a second wife may be taken for the sake of offspring; or when the first wife loses vigor and has no grown daughters, the man may take a younger wife to assist in the household duties. Sometimes the second wife is taken at the request of the first, while at other times the second wife is regarded as a rival. When a rich man has two wives he usually divides his flock and makes for each wife a tent and provides for her support. The poor man lives with his two wives in one small tent.

Chukchi men have no hesitancy in marrying stranger women — Russian, Lamut, and Tungusian,— paying for them high prices. In cases of marriages within the tribe no price is paid in skins, deer, or other valuables, and they ridicule their neighbors "who take payment for a girl as for a reindeer cow."

The marriage rite is very simple. Its chief feature consists of anointing with the blood of a reindeer slain for the purpose. The bride and bridegroom, with other members of his family, paint on her face the hereditary signs of her new family by which she casts off her old family gods and assumes the new ones. When the bridegroom is taken to the family of his father-in-law, his family totem marks and gods are discarded and he paints on his face the totem of the family to which he will henceforth belong.

Status of women.—The status of women is rather low. They must perform much hard and dirty work, for nearly all domestic occupations — the preparation of food, making of clothing, pitching and striking of the tent, and the bringing of wood—are undertaken by them; besides, the younger women, if not burdened with an infant, help their husbands to herd the flocks.

According to a Chukchi saying, "Woman is more thrifty than man in three particulars — getting children, preparing food, and watching the flocks."

In camp women prepare and serve the men their daily meals, while for themselves they are contented with the leavings. During the evening the women are busy in the outer room while the men idle away the time in the sleeping-room awaiting supper. The housewife comes inside only after the meal is over and in order to put away the dishes. Then she can go to bed.

Children.—The Chukchi families are rich in children, of whom the parents are very fond. When ten years of age the boy, and often the girl, are sent to watch the flocks. Half-grown boys are kept very strictly; they are badly and scantily fed, are not always allowed to sleep in the tent, and are compelled to do the larger part of the herding. Meanwhile the father has more leisure and visits the flock only in bad weather or in the mosquito season, when the reindeer become restless.

Treatment of the aged.—Voluntary death.—The custom of putting to death the aged and sick is due to the hard conditions of life in the arctic wilderness. It is also a part of the Chukchi system of ethics. The old and sick consider death a right, not a duty, and often claim this right notwithstanding the opposition of their kinsmen. The custom of voluntary death sometimes passes by inheritance, though it is not held to be irrevocable. If once a man expresses a desire to die in such manner, he has no right to turn back on account of the trouble that his change of mind may bring to his family. Such a man is considered to be a victim of the *kê'lat*, and no man has the right to take from them a promised sacrifice. For instance, if a herdsman, angered at his flocks for their restlessness, should say to them, "Let the wolves eat you," as is usual with the reindeer Chukchi, he is considered to have promised his entire flock to the *kê'lat*, to whom the wolves are said to be akin, and the promise must be redeemed by slaying several of his best animals.

Survival of vassalage.—Young members of poor families, usually from other tribes, help wealthy Chukchi reindeer-owners to herd their flocks, receiving in return food, clothing, and gifts of living animals. The conditions of such an agreement are uniformly fixed. The newcomer generally brings with him or obtains on the spot his tent, which is kept in order by his wife, mother, or sister, for without a woman's aid no genuine herder can long exist ; he also brings or acquires a few team reindeer for transporting his domestic goods. The poor "neighbor-mate" (*nîmtumghîn*) is now simply a workman (*chawchuwdamŏ'lîn*), whereas in former times his first duty was to defend against hostile attacks, thus supporting what may be regarded as a system of vassalage. According to tradition there were formerly bondmen and bondwomen, acquired through captivity or by purchase. Now there are no slaves, but it is not unusual to hear people taunted on account of their descent from Koryak or Eskimo boys. But on the whole this "neighborhood tie" was never so strong that the bond could not be severed when occasion demanded.

Crime.—Murder or infringement upon rights and property is punished by vendetta, but if the wrong is done within the limits of the family, outsiders have no right to interfere. Thus crimes against near kinsmen, which are by no means rare among the Chukchi, remain unavenged. "We have done it among ourselves" was regarded as a sufficient explanation when Yî'ketî and Kóta cut their father's throat while in camp near Cape Erri in 1895. In the summer of 1896, on Poplar river, southward from the Little Anuy, in the Kolyma country, a young man killed his brother in order to get possession of his flock. The murderer, with his accomplice, named Kônti'îrghîn, and their victim, arranged a contest of springing over a barrier, the loser to pay his fine by making several springs with his feet bound together. When the elder brother lost, the murderer and his accomplice performed their foul deed. The fratricide took the flock and went unpunished. Kônti'îrghîn related this story to me in the midst of a group of listeners gathered in the tent of a wealthy and respectable reindeer-breeder named Lame (Ghaghánto). Here Kônti′îrghîn lived as an aspirant for Lame's elder daughter. None of the listeners showed any signs of disapprobation, but on the morrow, when one of the sons of Ghaghánto let his knife fall in Kônti′îrghîn's presence, my fellow traveler, pointing out the young man, shouted: "Don't let your knife fall near him; he will seize it and kill you as he did another!" Kônti′îrghîn reddened but made no reply. Ghaghánto afterward told me in confidence that Kônti′îrghîn had no reason to remain longer in his camp, since he did not desire a murderer for a son-in-law; but even then I was not sure whether the cunning old man was sincere in his disapproval or whether he was trying to appear civilized.

The vendetta can be bought off with sufficient ransom. In the spring of 1895, when, during a brawl at the Anuy fair, a Chukchi was killed, a kinsman in my presence insisted that one of the Cossacks participating in the murder should be given to them to take care of the wife and children of the deceased. In former times a man taken as ransom would be enslaved, at least for a time; but in this case the Cossack was bought off with brick-tea, tobacco, and sugar. Nevertheless, the Chukchi made wry faces, and we feared they would attack our small wooden fort. Most of the people were concerned with trade rather than with the life of an individual, so the fair went on and ended in the usual way. Six months later, however, when traveling along Wolverine river, in the country of the upper Anuy, I was compelled to face the ill-will of people with whom I had been on friendly terms for two years, and to the very last some of my followers were robbed and we nearly came to blows on account of this difficulty.

THE TECHNIC OF ABORIGINAL AMERICAN BASKETRY

By OTIS T. MASON

Basketry is one of the textile industries. It is differentiated from network and loom products by the fact that its materials are usually rigid. However, no wide gulf separates the different varieties of textiles, basketry merging on the one side into lace work and on the other into bagging and other soft fabrics, its own types and classes also being often associated in the same example. In form, basketry varies through the following classes of objects:

1. Flat mats or wallets, generally flexible.
2. Plaques or food plates, which are slightly concave.
3. Bowls for mush and other foods, and for ceremonial purposes, hemispherical in general outline.
4. Pots for cooking, with cylindrical sides and rounded bottoms.
5. Jars and fanciful shapes, in which the mouth is constricted, frequently very small, and now and then supplied with covers. The influence of civilization in giving modern shapes to basketry has not been beneficial to this class of forms.

There are two distinct types of basketry, namely, (I) *hand-woven* or *plicated* basketry, which is built on a warp foundation, and (II) sewed or wrapped basketry, which is built on a coiled foundation of rods, splints, or straws, and is called *coiled* basketry.

I.—KINDS OF WOVEN BASKETRY

Woven or plicated basketry may be divided into several kinds or subvarieties. It is to be understood that no loom is ever used in basketwork. Matting is frequently made over a bar, and soft wallets require a framework to hold the warp, but in basket-making all the insertion of weft or filling is done with the fingers, as in plaiting or braiding.

a. Checkerwork.—This occurs in the bottoms of many North Pacific Coast examples and also in the work of eastern Canadian tribes (figure 9). In this ware the warp and the weft have the same width, thickness, and pliability. It is impossible, therefore, in looking at the bottoms of the cedar-bark baskets and the matting of British Columbia (figure 10) or eastern Canada, to tell which is warp and which is weft. Indeed, in very many examples the warp and weft of a checker bottom are turned up at right angles to form the warp of the sides, which may be wicker or twined work. A great deal of bark matting is made in this same checkerwork, but the patterns run obliquely to the axis of the fabric, giving the appearance of diagonal weaving. When warp and weft are fine yarn or threads, the result is the simplest form of cloth in cotton, linen, piña fiber, or wool. The cheap fabrics of commerce are of this species of weaving. In art, latticework frequently shows the bars intertwined as in checker basketry.

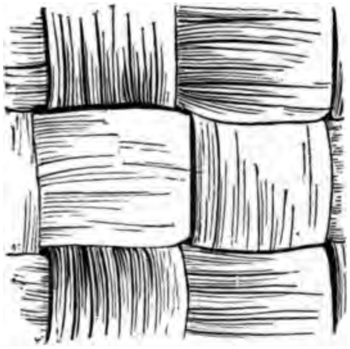

FIG. 9—Plain checker weaving in basketry with hard material.

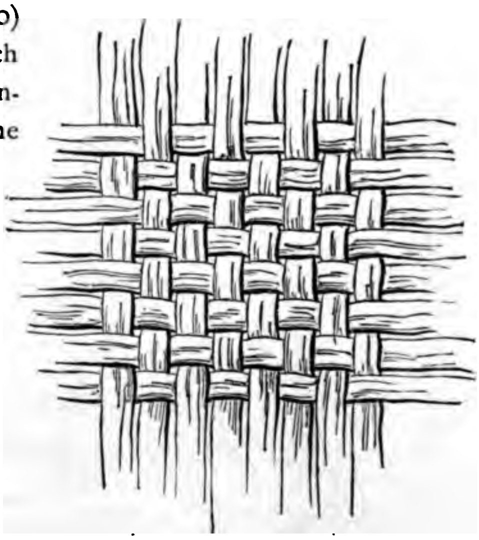

FIG. 10—Plain checker weaving in basketry with bast or other soft material.

b. Diagonal or twilled basketry.—This is seen in those parts of the world where cane abounds. In America it is common in

British Columbia, Washington, southern United States, Mexico, and Central America, and of excellent workmanship in Guiana and Ecuador. The fundamental technic of diagonal basketry is in passing each element of the weft over two or more warp elements, thus producing either diagonal or twilled, or, in the best examples, an endless variety of diaper patterns (figure 11).

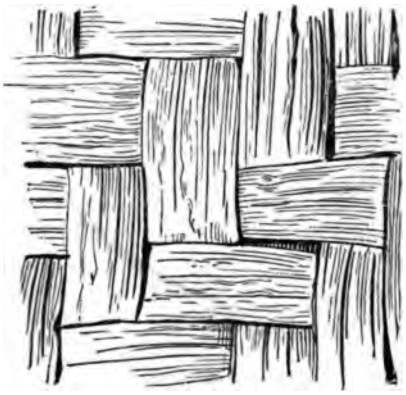
FIG. 11—Diagonal or twilled weaving in basketry with flat, ribbon-like elements.

Excellent effects are produced in this kind of weaving by means of color. Almost any textile plant, when split, has two colors: that of the outer or bark surface, and that of the interior woody surface or pith. Also, the different plants used in diagonal basketry have great variety of color. By the skilful manipulation of the two sides of a splint, or by using plants of different species, geometric patterns, frets, labyrinths, and other designs in straight-line are possible. Examples of matting from the nitrous caves and modern pieces from the Cherokee — both in matting and basketry — are double. By

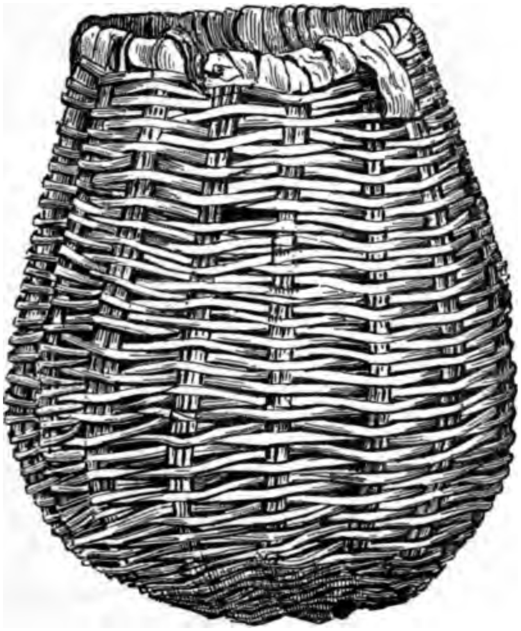
FIG 12 Wickerwork or wicker weaving in basketry, in round stems.

this means both the inside and the outside of the texture expose the glossy outer silicious surface of the cane.

c. Wickerwork.—This is common in eastern Canada; it is unknown on the Pacific coast and Interior basin, excepting in one or two pueblos, but is seen abundantly in southern Mexico and Central America. It consists of a wide or a thick and inflexible warp, and a slender flexible weft (figure 12). The weaving is plain and differs from checkerwork only in the fact that one of the elements is rigid. The effect on the surface is a series of ridges. It is possible also to produce diagonal effects in this type of weaving.

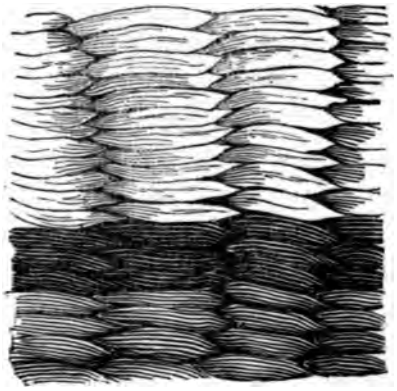

FIG. 13—Close wickerwork on Hopi plaque, the warp hidden.

The finest specimens of wickerwork in America are the very pretty Hopi plaques made of *Bigelovia graveolens*. Short stems are dyed in various colors, worked into the warp, and driven tightly home so as to hide the ends and also the manner of weaving (figure 13). Various patterns are effected on the surface—clouds, mythical birds, and symbols connected with worship. It has passed into modern industry through the cultivation of osiers, rattan, and such plants, for market-baskets, covers for glass bottles, and in ribbed cloth, wherein a flexible weft is worked on a rigid warp.

d. Twined or wattled basketry.—This is found in ancient mounds of Mississippi valley, in bagging of the Rocky mountains, and all down the Pacific coast from the island of Attu, the most westerly of the Aleutian chain, to the borders of Mexico. It is the most elegant and intricate of all in the woven or plicated species. Twined work has a set of warp-rods or rigid elements, as in wickerwork; but the weft elements are commonly administered in pairs, though in three-ply twining and in braid twining three weft elements are employed. In passing from warp to warp these elements are twisted in half-turns on each other so as to form a two-ply or three-ply twine or braid. According to the relation of these weft elements to one another and to the warp, different structures result as follows:

1. Plain twined weaving, over single warps.
2. Diagonal twined weaving or twill, over two or more warps.
3. Wrapped twined weaving, or birdcage twine, in which one weft element remains rigid and the other is wrapped about the crossings.
4. Latticed twined weaving, *tee* or Hudson stitch, twined work around vertical warps crossed by horizontal weft element.
5. Three-ply twined weaving and braiding in several styles.

1. *Plain twined weaving.* — Plain twined weaving is a refined sort of wattling. The ancient engineers in America who built obstructions in streams to aid in catching or impounding fish, drove a row of sticks into the bottom of the stream, a few inches apart. Vines and brush were woven upon these upright sticks which served for warp. In passing each stake the two vines or pieces of brush made a half-turn on each other. This is a very primitive mode of weaving. Plain twined basketry is made on exactly the same plan: there is a set of warp elements which may be reeds, or splints, or string. The weft consists of two strips of root or other flexible material, and these are twisted as in forming a two-ply string passing over a warp stem at each half-turn (figure 14). Pleasing varieties of this plain twined weaving will be found in the Aleutian islands. The Aleuts frequently use for their warp, straws of wild rye or other grasses in which the straws are split and the two halves pass upward in zigzag form;

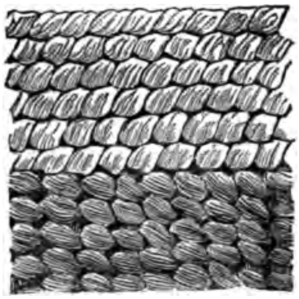

FIG. 14—Plain twined weaving in Nez Percé wallet.

each half of a straw is caught alternately with the other half of the same straw and with a half of the adjoining straw, making a series of triangular instead of rectangular spaces (figure 15).

A still further variation is given to plain twined ware by crossing the warps. In bamboo basketry of eastern Asia these crossed warps are also interlaced or held together by a horizontal strip of bamboo passing in and out as in ordinary weaving. In such examples the interstices are triangular, but in the twined example here described (figure 16) the weaving passes across between the points where the warps intersect each other, leaving hexagonal interstices. This peculiar combination of plain twined weft and crossed warp has not a wide distribution in America, but examples are to be seen in southeastern Alaska and among relics found in Peruvian graves.

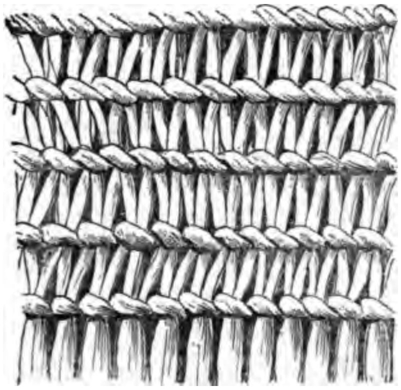

FIG. 15—Plain twined weft on zigzag warp in Aleut wallet.

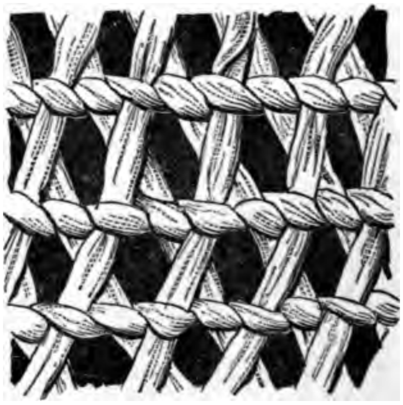

FIG. 16—Twined weaving on crossed warp.

2. *Diagonal twined weaving.*—In diagonal twined weaving the twisting of the weft filaments is precisely the same as in plain twined weaving. The difference of the texture on the outside is caused by the manner in which the wefts cross the warps. This style abounds among the Ute Indians and the Apache, who dip the bottles made in this fashion into pitch and thus make a water-tight vessel, the open meshes receiving the pitch more freely.

The technic of diagonal twined weaving consists in passing over two or more warp elements at each half-turn; there must be an odd number of warps, for in the next round the same pairs of warps are not included in the half-turns. The ridges on the outside, therefore, are not vertical as in plain twined weaving, but pass diagonally over the surface, hence the name (figure 17). This method of manipulation lends itself to the most beautiful and delicate twined work of the Pomo Indians. Gift baskets, holding more than a bushel and requiring months of patient labor to construct, are thus woven. Figure 18 shows how, by varying the color of the weft splints and changing from diagonal to plain weaving, the artist is enabled to control absolutely the figure on the surface.

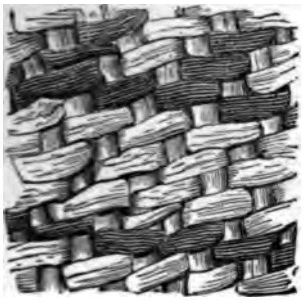

FIG. 17—Diagonal twined weaving, twilled patterns.

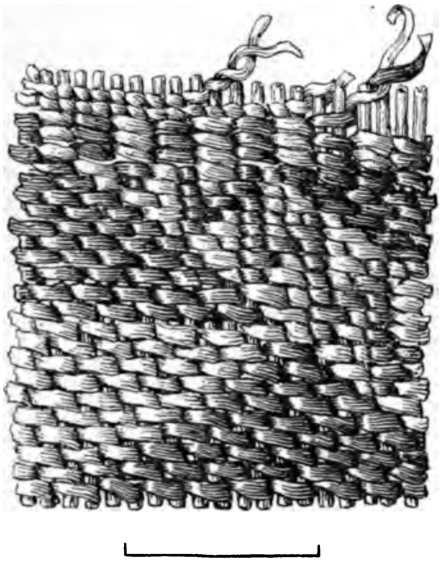

FIG. 18—Outside view of mixed twined weaving.

3. *Wrapped twined weaving.*—In wrapped twined weaving one element of the twine passes along horizontally across the warp stems, usually on the inside of the basket. The binding element of splint, or strip of bark, or string, is wrapped around the crossings of the horizontal element with the vertical warp (figure 19). On the outside of the basket the turns of the wrapping are oblique; on the inside they are vertical. It will be seen, on examining this figure, that one row inclines to the right, the one

above it to the left, and so on alternately. This was occasioned by the weaver's passing from side to side of the square carrying-basket, and not all the way round as usual. The work is similar to that in an old-fashioned birdcage where the upright and horizontal wires are held in place by a wrapping of finer soft wire. The typical example of this wrapped or birdcage twine is to be seen among the Indians of the Wakashan family living about Neah bay, Vancouver island, and southwestern British Columbia (figure 20).

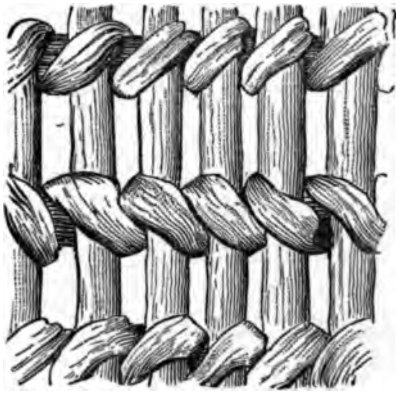

FIG. 19—Wrapped twined weaving or birdcage pattern.

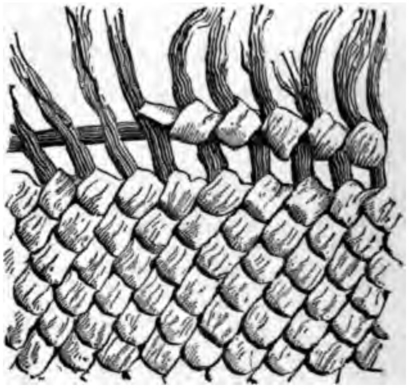

FIG. 20—Wrapped twined weaving or birdcage pattern in soft material.

In this type the warp and the horizontal strip behind the warp are both in soft cedar bark. The wrapping is done with a tough straw-colored grass. When the weaving is beaten home tight the surface is not unlike that of a fine tiled roof, the stitches overlying each other with perfect regularity.

Figure 21 shows a square inch of the inside of a basket with plain twined weaving in the two rows at the top; plain twined weaving in which each turn passes over two warp rods in four rows just below; in the middle of the figure, at the right side, it will be seen how the wrapped or birdcage twined work appears on the inside, and in the lower right-hand corner is the inside view of diagonal twined weaving. In the exquisite piece from which this drawing was made, the skilful woman has combined four styles of two-ply twined weaving. On the outside of the basket these various methods stand for delicate patterns in color.

4. *Lattice twined weaving.*—The lattice twined weaving, so far as the collections of the United States National Museum show, is confined to the Pomo Indians, of the Kulanapan family, residing on Russian river, California. Dr Hudson calls this technic *tee*. This is a short and convenient word and may be used for a specific name. The *tee* twined weaving consists of four elements—(*a*) the upright warp of rods, (*b*) a horizontal warp crossing these at right angles, and (*c*, *d*) a regular plain twined weaving of two elements, holding the warps firmly together (figure 22). In all the examples in the National Museum the horizontal or extra warp is on the outside of the basket. On the outside the *tee* basketry does not resemble the ordinary twined work, but on the inside it is indistinguishable. Baskets made in this fashion are very rigid and strong, and frequently the hoppers of mills for grinding acorns, and also water-tight jars are thus constructed. The ornamentation is confined to narrow bands, the weaver being greatly restricted by the technic.

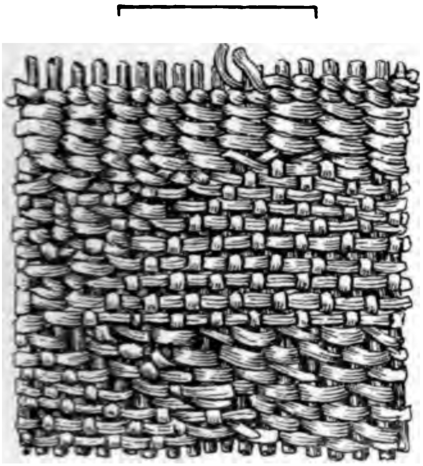

FIG. 21—Inside view of mixed two-ply twined weaving.

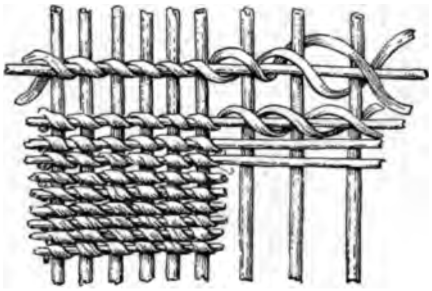

FIG. 22—Tee or lattice twined weaving. Peculiar to the Pomo, of Russian river, Cal.

5. *Three-ply twined weaving.*—Three-ply twined weaving is the use of three weft-splints or other kinds of weft elements instead of two, and there are five ways of administering the weft:

(a) *Three-ply twine* (figures 23 and 24).—In this technic the basket-weaver holds in her hand three weft elements of any of the kinds mentioned. In twisting these three, each one of the strands, as it passes inward, is carried behind the warp stem adjoining; so that in a whole revolution the three weft elements have in turn passed behind three warp elements. After that the process is repeated *ad libitum*. By referring to the lower halves of figures 23 and 24, the outside and the inside of this technic will be made plain.

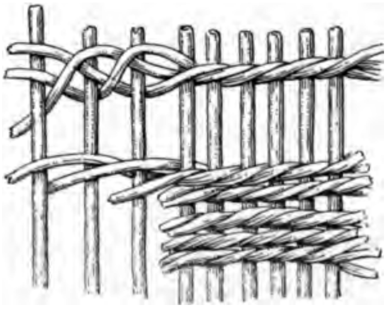

FIG. 23—Outside view of three-ply braid and three-ply twined weaving, the weft having three elements.

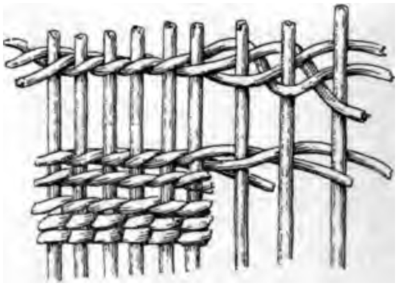

FIG. 24—Inside view of three-ply braid and three-ply twined weaving.

On the outside there is the appearance of a two-ply string laid along on the warp stems, while on the inside the texture looks like plain twined weaving. The reason for this is apparent, since in every third of a revolution one element passes behind the warp and two remain in front.

(b) *Three-ply braid.*—In three-ply braid the weft elements are held in the hand in the same fashion, but instead of being twined simply they are plaited or braided, and as each element passes under one and over the other of the remaining two elements, it is carried inside a warp stem. This process is better understood by examining the upper parts of figures 23 and 24. On the surface, when the work is driven home, it is impossible to discriminate between three-ply twine and three-ply braid. The three-ply braid is found at the starting of all Pomo twined baskets, no matter how the rest is built up.

Figure 25 shows a square inch from the surface of a Hopi twined jar. The lower part is in plain twined weaving; the upper part is in three-ply twine. Philologists have come to the conclusion that the Hopi are a very mixed people. The three-ply work shown in this figure is a Ute motive. The National Museum collections represent at least seven different styles of basketry technic practiced among the Hopi people of Tusayan.

(c) *Three-ply overlaid twined weaving.*—In Tlinkit basketry the body is worked in split spruce-root, which is exceedingly tough. The ornamentation, in which mythological symbols are concealed, consists of a species of embroidery in which the figures appear on the outside of the basket, but not on the inside. In the needlework of the civilized woman the laying on of this third element would be called embroidery, but the Indian woman twines it into the textile while the process of basket-making is going on; that is, when each of the weft elements passes between two warp rods outward, the colored or overlaid element is wrapped around it once. Straws of different colors are employed (figure 26). An interesting modification of this Tlinkit form of overlaying or false embroidery occurs occasionally among the Pomo Indians under the name of *bŏg* or *băg*, and it is fully explained and illustrated by James Teit in his memoir[1] on the Thompson

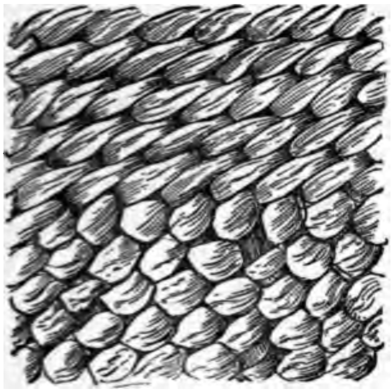

FIG. 25—Three-ply and two-ply twined weaving on the same basket jar.

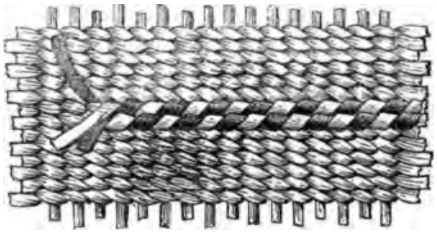

FIG. 26—Three-ply overlaid twined weaving. Tlinkit pattern. After Wm. H. Holmes.

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[1] *Memoirs of the American Museum of Natural History*, vol. II, New York, 1900, figure 132, p. 190.

River Indians. In this Thompson River example the twine or weft element is three-ply. Two of them are spun from native hemp or milkweed, and form the regular twined two-ply weaving. Around this twine the third element is wrapped or served, passing about the other two and between the warp elements, and then the whole is pressed down close to the former rows of weaving. On the outside of the bag this wrapping is diagonal, but on the inside the turns are perpendicular. The fastening off is coarsely done, leaving the surface extremely rough. I am indebted to Dr Franz Boas for the use of Mr Teit's figure. This combination is extremely interesting. The author says that it "seems to have been acquired recently through intercourse with the Sahaptins." A little attention to the stitches will show that the bags and the motives on them are clearly Nez Percé or Shahaptian, but the wrapping of corn-husk outside the twine is not done in Nez Percé fashion, but after the style of the Makah Indians of Cape Flattery, who are Wakashan (figure 27).[1]

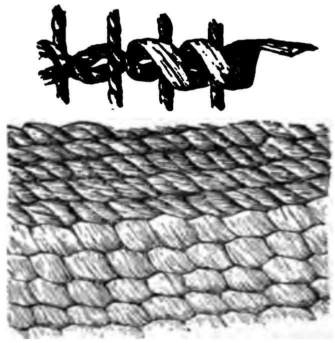

FIG. 27—Three-ply wrapped or served twined weaving. After James Teit.

II.—COILED BASKETRY

Coiled basketry is produced by an over-and-over sewing with some kind of flexible material, each stitch interlocking with the one immediately underneath it. The transition between lacework and coiled basketry is interesting. In the netted bags of pita fiber, common throughout middle America, in the muskemoots or Indian bags of fine caribou-skin thong from the Mackenzie River district, as well as in the lace-like netting of the

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[1] See *Scientific American*, July 28, 1900, and *American Anthropologist* (N. S.), April, 1900.

Mohave carrying-frames and Peruvian textiles, the sewing and interlocking constitute the whole texture, the woman doing her work over a short cylinder or spreader of wood or bone, which she moves along as she works. When the plain sewing changes to half-hitches, or stitches in which the moving part of the filament or twine is wrapped or served one or more times about itself, there is the rude beginning of open lacework. This is seen in Fuegian basketry as well as in many pieces from various parts of the Old World.

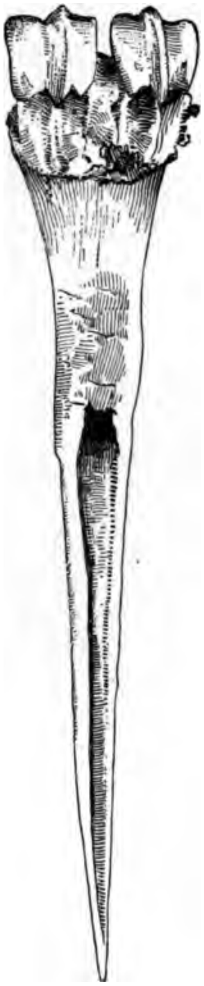
FIG. 28—Bone awl for making coiled basketry.

The sewing materials vary with the region. In the Aleutian islands it is a delicate straw; in the adjacent region it is spruce-root; in British Columbia it is cedar- or spruce-root; in the more diversified styles of the Pacific states every available material has been used—stripped leaf, grass stems, rushes, split root, broad fillets, and twine, the effect of each being well marked. In all coiled basketry, properly so-called, there is a foundation more or less rigid, inclosed within stitches, the only implement used being originally a bone awl (figure 28).

Figure 28 shows the metatarsal of an antelope sharpened in the middle and harder portion of the column, the joint serving for a grip to the hand. Mr Cushing was of the opinion that the bone awl was far better for fine basketwork than any implement of steel; the point, being a little rounded, would find its way between the stitches of the coil underneath and not force itself through them. The iron awl, being hard and sharp, breaks the texture and gives a very rough and clumsy appearance to the surface, as will be seen in figure 34. In every culture-province of

America wherever graves have been opened, the bone stiletto has been recovered, showing the widespread use of threads or filaments employed in joining two fabrics, or for perforating those already made to receive coilwork and other embroideries.

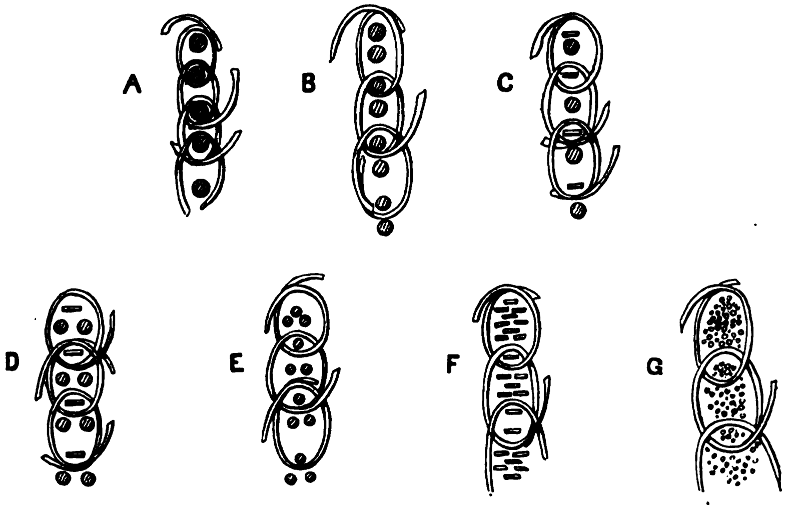

FIG. 29—End view of stitches in coiled basketry: A, single-rod foundation; B, two-rod, vertical foundation; C, rod and welt foundation; D, two-rod and welt foundation; E, three-rod foundation; F, splint foundation; G, grass or shred foundation.

Coiled basketry may be divided by the foundation filaments into the following classes:

a. Single-rod foundation.—In rattan basketry and Pacific Coast ware, called by Dr Hudson *tsai*, in the Pomo language, the foundation is a single stem, uniform in diameter. The stitch passes around the stem in progress and is caught under the one of the preceding coil, as in figure 29 A. In a collection of Siamese basketry in the National Museum the specimens are all made after this fashion; the foundation is the stem of the plant in its natural state, the sewing is with splints of the same material, having the glistening surface outward. As this is somewhat unyielding, it is difficult to crowd the stitches together and so the foundation is visible between.

In America, single-rod basketry is widely spread. Along the

Pacific coast it is found in northern Alaska and as far south as the borders of Mexico. The Pomo Indians use it in some of their finest work. The roots of plants and soft stems of willow, rhus, and the like, are used for the sewing, and being soaked thoroughly can be crowded together so as to entirely conceal the foundation (figure 30).

b. Two-rod foundation.—One rod in this style lies on top of the other; the stitches pass over the two rods in progress and under the upper one of the pair below, so that each stitch incloses three stems in a vertical series. A little attention to figure 31 will demonstrate that the alternate rod or the upper rod in each pair will be inclosed in two series of stitches, while the other or lower rod will pass along freely in the middle of one series of stitches and show on the outer side. Examples of this two-rod foundation are to be seen among the Athapascan tribes of Alaska, among the Pomo Indians of the Pacific coast, and among the Apache of Arizona. An interesting or specialized variety of this type is seen among the Mescaleros of New Mexico, who use the two-rod foundation, but instead of passing the stitch around the upper rod of the coil below, simply interlock the stitches so that neither one of the two rods is inclosed twice. This Apache ware is sewed with yucca fiber and the brown stems

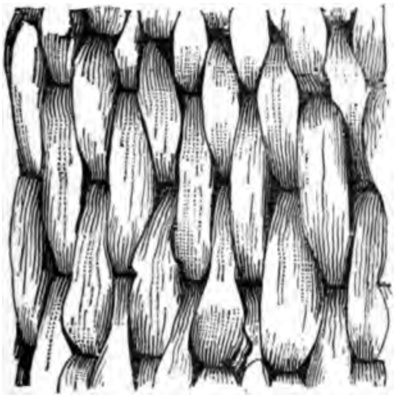
FIG. 30—Coiled work on single-rod foundation.

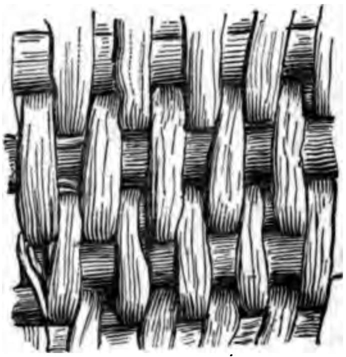
FIG. 31—Coiled work on two-rod, vertical foundation.

of other plants, producing a brilliant effect, and the result of the special technic is a flat surface like that of pottery. The National Museum possesses a single piece of precisely the same technic from the kindred of the Apache on the lower Yukon.

c. Rod and welt foundation.— In this kind of basketry the single rod of the foundation is overlaid by a strip or splint of tough fiber — sometimes the same as that with which the sewing is done, at others a strip of leaf or bast. The stitches pass over the rod and strip which are on top down under the welt only of the coil below, the stitches interlocking. The strip of tough fiber between the two rods which serves for a welt has a double purpose — strengthening the fabric and chinking the space between the rods. This style of coil work is seen on old Zuñi basket-jars and on California examples. This type of foundation passes easily into forms *a* and *b* (figures 32 and 29 C and D).

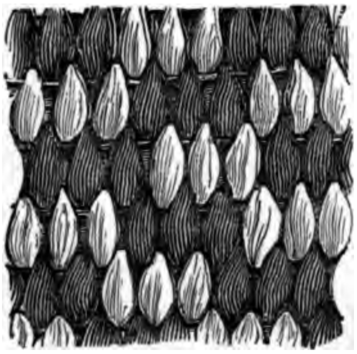

FIG. 32—Rod and welt foundation of coiled basketry.

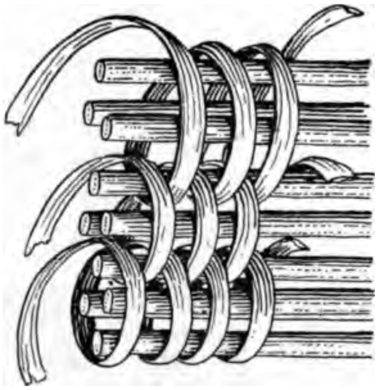

FIG. 33—Three-rod foundation in coiled basketry.

d. Three-rod foundation. — This is the type of foundation called by Dr Hudson *bam-tsu-wu.* Among the Pomo and other tribes in the western part of the United States the most delicate pieces of basketry are in this style. Dr Hudson calls them the "jewels of coiled basketry." The surfaces are beautifully corrugated and patterns of the most elaborate character can be wrought on them. The technic is as follows: Three or four small, uniform willow stems serve for the foundation, as shown in figure 33, also in cross-section in figure 29 E. The sewing, which may be in splints of willow, black or white carex root, or cercis stem, passes around the three stems constituting the coil, under the upper one of the bundle below, the stitches interlocking. In some examples this upper rod is replaced by a thin strip of material serving for a welt (see 29 D). In the California area the materials for basketry are of the finest quality. The willow stems and carex root are susceptible of division into delicate filaments. Sewing done with these is most compact, and when the stitches are pressed closely together the foundation does not appear. On the surface of the *bam-tsu-wu* basketry the Pomo weaver adds pretty bits of bird feathers and delicate pieces of shell. The basket represents the wealth of the maker, and the gift of one of these to a friend is considered to be the highest compliment.

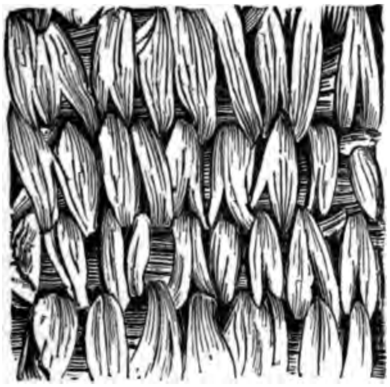

FIG. 34—Splint foundation of coiled basketry.

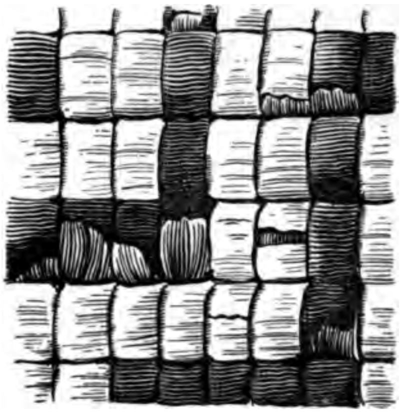

FIG. 35—Imbricated variety of splint coil in basketry, called Klikitat stitch.

e. Splint foundation.—In basketry of this type the foundation consists of a number of longer or shorter splints massed together and sewed, the stitches passing under one or more of the splints in the coil beneath (figures 29 F and 34). In the Pomo language it is called *chilo*, but it has no standing in that tribe. In the Great Interior basin, where the pliant material of the California tribes is wanting, only the outer and younger portion of the stem will do for sewing. The interior parts in such examples are made up into the foundation. All such ware is rude, and the sewing frequently passes through instead of around the stitches below. In the Klikitat basketry the pieces of spruce or cedar root not used for sewing material are also worked into the foundation (figures 35–37).

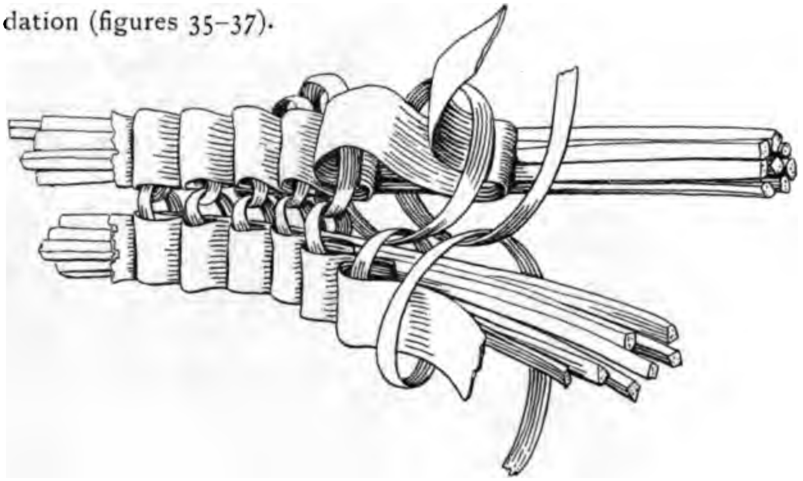

FIG. 36—Detail of imbricated basketry.

In a small area on Fraser river, in southwestern Canada, and on the upper waters of the Columbia, basketry called "Klikitat" is made. The foundation, as stated, is in splints of cedar or spruce root, while the sewing is done with the outer and tough portion of the root; the stitches pass over the upper bundle of splints and are locked with those underneath. On the outside of these baskets is a form of technic which also constitutes the ornamentation. It is not something added, or overlaid, or sewed on, but is a part of the texture effected in the progress of the manufacture (figures 36, 37).

The method of adding this ornamentation in strips of cherry bark, cedar bast, and grass stems dyed with Oregon grape, is unique, and on this account I have applied the term *imbricated* to the " Klikitat " basket, as shown in figures 35 to 37. The strip of colored bark or grass is laid down and caught under a passing stitch; before another stitch is taken this strip is bent forward to cover the last stitch, doubled on itself so as to be underneath the next stitch, and so with each stitch it is bent backward and forward so that the sewing is entirely concealed, forming a sort of " knife plaiting." In some of the finer old baskets in the National Museum, collected sixty years ago, the entire surface is covered with work of this kind, the strips not being over an eighth of an inch wide. Mr James Teit[1] describes and illustrates this type of weaving among the Thompson River Indians of British Columbia, who are Salishan. The body of the basket is in the root of *Thuja gigantea*, and the ornamentation in strips of *Elymus triticoides* and *Prunus demissa* (figure 37).

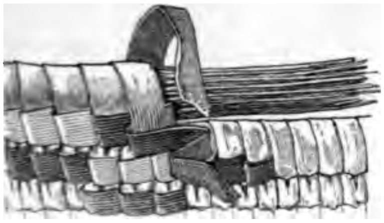
FIG. 37—Imbricated basketry detail from the Thompson River Indians, British Columbia. After James Teit.

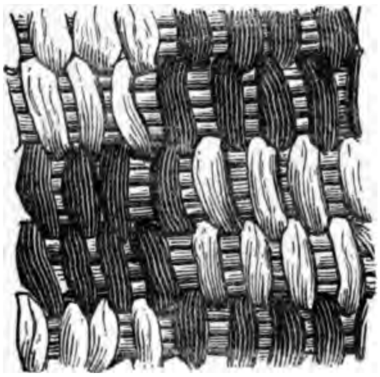
FIG. 38—Coiled basketry with grass foundation.

f. Grass foundation.—The foundation of this type of basketry is made up of a small bundle of straws or rushes. The sewing may be done with split stems of hardwood, willow, rhus, and the like, or, as in the case of the Mission baskets in southern California, of the stems of rushes (*Juncus acutus*), or stiff grass (*Epicampes rigidum*). See figure 38 and the cross-section given in figure 29 G. In the larger granary baskets of the Pima a bundle of straws furnishes the foundation, while the sewing is done with broad strips of tough bark, as in figure 39. In the Fuegian coiled basketry, of which no figure is given, the sewing is done with rushes, but instead of being in the ordinary over-and-over stitch it consists of a series of half-hitches or buttonhole stitches.

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[1] *Memoirs of the American Museum of Natural History*, Anthropology, I, page 169, figure 131 *a*.

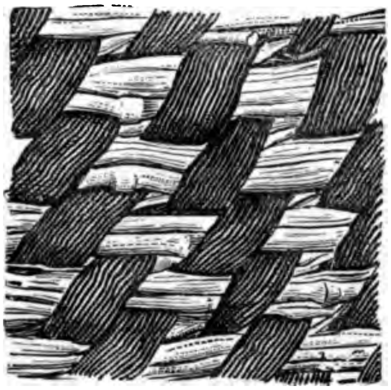

FIG. 39—Coiled work sewed with broad strips of tough bark.

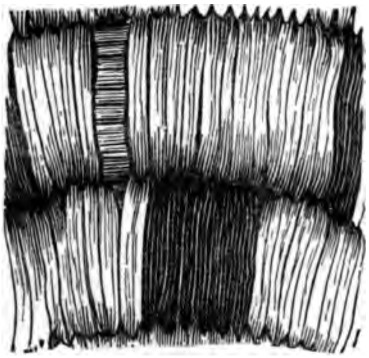

FIG. 40—Coiled work on shred foundation, from the hard parts of yucca leaves.

Among the basketry belonging to the grass-coil foundation type are the Hopi plaques built upon a thick bundle of the woody stems of the yuccas, which furnish also the sewing material from the split leaf (figure 40). If this be examined in comparison with a style of basketry found in Egypt and in northern Africa as far as the Barbary states, great similarity will be noticed in the size of the coil, the color of the sewing material, the patterns, and the stitches. The suggestion is here made that this particular form of workmanship may be due to acculturation, inasmuch as this type of basketry is confined in America to the Hopi pueblos, which were brought very early in contact with Spaniards and African slaves.

Ornamentation in basketry is produced by the use of different colored materials, by overlaying, embroidery, dyes, featherwork, shells, beads, etc. The technic of decoration and the geographic distribution of the forms of technic explained in this paper must be reserved for another time.

MEMORANDA ON THE MAYA CALENDARS USED IN THE BOOKS OF CHILAN BALAM

By CHARLES P. BOWDITCH

Dr Brinton, in his *Maya Chronicles*, has translated the following passages from the Book of Chilan Balam of Mani:

> . . . in the thirteenth Ahau Ahpula died; for six years the count of the thirteenth Ahau will not be ended; the count of the year was toward the East, the month Pop began with (the day) fourth Kan; the eighteenth day of the month Zip (that is) 9 Ymix, was the day on which Ahpula died; and that the count may be known in numbers and years, it was the year 1536.

And again from the Book of Chilan Balam of Tizimin:

> The thirteenth Ahau; the death of Ahpulha took place; it was the sixth year when ended the count of the thirteenth Ahau,— the count of the year was from the east (the month) Pop passed on the fourth Kan; on the eighteenth of (the month) Zip, 9 Imix was the day Ahpulha died; it was the year 1536.

In his remarks on these books Dr Brinton says:

> According to the reckoning as it now stands, six complete great cycles were counted, and parts of two others, so that the native at the time of the Conquest would have had eight great cycles to distinguish apart.
>
> I have not found any clear explanation how this was accomplished. We do not even know what name was given to this great cycle,[1] nor whether the calendar was sufficiently perfected to prevent confusion in dates in the remote past.

It would seem, however, as if the reckoning of time as given in these books is very accurate, fixing a date which would not be duplicated within a limit of thirty-five hundred or four thousand years.

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[1] It should be noted that the grand cycle, which Dr Brinton refers to, is the period of 13 x 7200 days = 93,600 days or 260 periods of 360 days; while the grand cycle according to Goodman's method is 13 x 144,000 days or 5200 periods of 360 days.

The Books of Chilan Balam number the katuns on a different principle from that used on the inscriptions or in the Dresden Codex, but the two methods can be readily and usefully brought together, as the katun itself remains the same in both methods. In the inscriptions the katuns are numbered from 0 to 19, using Goodman's method though not his exact nomenclature, and twenty of them equal one cycle. In the Chilan Balam books, the katuns are named as Katun 13 Ahau, Katun 11 Ahau, etc., these being the days with which they begin or with which the previous katun ended; and as after thirteen katuns the same name is again given, this nomenclature fixes a date within a period which equals 13 multiplied by the number of days in a katun. There has been a difference of opinion as to this number of days in a katun, but it is clear from the Books of Chilan Balam that their reckoning was by terms of 20 x 360 days. The followers of Perez, however, insist that the length of the katun was 24 x 365 days. Sr Perez has indeed made this assertion,[1] but he rests his opinion to a great degree on the fact that the naming of the katuns proceeded in the following order, taking their names from the day Ahau with which they began, viz.:

Katun 13 Ahau,
Katun 11 Ahau,
Katun 9 Ahau,
Katun 7 Ahau, etc.,

and that by starting with a katun which begins with 13 Ahau and counting forward a period of 24 x 365 days, we should reach another katun beginning with 11 Ahau. But the same result is brought about by considering the katun as a period of 20 x 360 days, as has been shown by Dr Seler, among others; and since the Books of Chilan Balam state distinctly that they reckon by so many scores of so-called years, and as the initial dates of the inscriptions all reckon in the same way, it is now generally considered that the katun consisted of 20 x 360 or 7200 days. An objection to considering a katun as 20 x 360 days may be raised in that the Books of Chilan Balam use the word "año" or year, but this can be easily explained by the fact that the Spanish "year" was the period which most nearly agreed with their tun or 360-day period, and that the Books did not pretend to speak with scientific accuracy.

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[1] Stephens, *Incidents of Travel in Yucatan*, p. 441 et seq.

Besides the above count, it is well known that the Mayas had a year-and-month count. This consisted in naming each one of the twenty days and in attaching to each of these days one of the numbers 1 to 13. Besides this, each day so numbered was declared to be a given day of a given month and to occur in a year marked by one of the year bearers—as for instance in the Book of Chilan Balam, already quoted, where the day is given as 9 Ymix 18 Zip in the year 4 Kan. Now this day and this year could recur only after the lapse of fifty-two years or 18,980 days.

It should be noted here that in the inscriptions and in the Dresden Codex, the day Ymix was always the day 4, 9, 14, or 19 of any month, showing that the day 1 of the month was Eznab, Akbal, Lamat, or Ben; while in Landa and the Books of Chilan Balam the day Ymix was the day 3, 8, 13, or 18, showing that the day 1 of the month was Cauac, Kan, Muluc, or Ix. That is, the months in modern times began with the day which followed the day with which the months began in more ancient times. As the tables are calculated for the inscriptions, it will be well, in order to facilitate our calculations, to call the day on which Ahpula died the nineteenth of the month Zip, instead of the eighteenth of that month.

Given that the katun consisted of 7200 days, a Katun 13 Ahau could not recur until after the lapse of 13 x 7200 or 93,600 days, and the recurrence of any day marked by the year-and-month count, and occupying any particular place in a given katun, could not occur until after the lapse of a period which is found by finding the least common multiple of the two numbers 93,600 and 18,980. This is 6,832,800 days, which is a period of 360 calendar rounds of 18,980 days or of 52 years each. This is equal to 18,720 years, and, in the method of reckoning shown in the initial dates of the inscriptions, would equal 3 grand cycles, 8 cycles, and 9 katuns, or, to use the method of Goodman, 3.8.9.0.0.0.

I have said that a day marked by the year-and-month count, and occupying any particular place in a given katun, could not recur until the lapse of this long period. This would be true if the day was specified as being a given day in a given tun in a given katun, or even if the day was stated as falling in a given uinal of a given tun in a given katun. But in the case before us the death of Ahpula is said to have taken place in the Katun 13 Ahau when six tuns or years of that katun remained unexpired. Even with this rather loose designation such a day would not recur within a period of 3500 or 4000 years.

The day 4 Ahau 8 Cumhu seems to have been regarded as the beginning day of the beginning cycle of some grand cycle. From this day all the initial series of the inscriptions of Copan and Quirigua, of Piedras Negras and Tikal, so far as we know them, count, except one where this day 4 Ahau 8 Cumhu is itself given. In this place (on Stela C of Quirigua) 4 Ahau 8 Cumhu is reckoned thus: "Grand cycle glyph .13.0.0.0.0.", while in the Temple of the Cross it is declared to be a thirteenth cycle. As this was the beginning date, there is reason to believe that the beginning cycle of a great cycle received the number 13.

I give here the first and last terms of a list of the beginning days of the Katuns 13 Ahau in a complete round of 18,720 years occurring after the beginning of the grand cycle called by Goodman Grand Cycle 54, which began with 4 Ahau 8 Cumhu. It is of little consequence what particular number is given to the grand cycle, as the whole series forms a continuous count, and I shall therefore follow Goodman, who gives the number 54 to the grand cycle glyphs common to Copan, Quirigua, etc.

If 54.13.0.0.0.0. or the beginning of the grand cycle, called Grand Cycle 54 by Goodman, begins with 4 Ahau 8 Cumhu, a Katun 13 Ahau will appear two katuns after this or with the count of

54.13.2.0.0.0.	13 Ahau	8 Mol	Year 10 Ix,

and other Katuns 13 Ahau will follow at intervals of 13 katuns as here given:

54.13.15.0.0.0.	13 Ahau	8 Pax	Year 6 Ix.
1. 8.	"	3 Xul	3 Cauac.
2. 1.	"	3 Kankin	12 "

. . . .

57.5.19.0.0.0.	13 Ahau	18 Ceh	11 Kan.
6.12		13 Uo	8 Muluc.
7. 5.		13 Yax	4 "
18.		13 Cumhu	13 "
57.8.11.0.0.0.	13 Ahau	8 Mol	10 Ix.

But we are seeking a Katun 13 Ahau in which 14 tuns have elapsed and of which 6 tuns still remain unexpired. We must, therefore, add 14 tuns or 14 x 360 days = 5040 days to each of the dates given and we shall then have the following complete list of the beginning days of Tun 14 of Katun 13 Ahau for the term of 18,720 years:

54.13. 2.14.0.0.	9 Ahau	18 Zotz	11 Kan.
15.		18 Ceh	7 Kan.
1. 8.		13 Uo	4 Muluc.
2. 1.		13 Yax	13 Muluc.
14.		13 Cumhu	9 Muluc.
3. 7.		8 Mol	6 Ix.
4. 0.		8 Pax	2 Ix.
13.		3 Xul	12 Cauac.
5. 6.		3 Kankin	8 Cauac.
19.		18 Zip	5 Kan.
6.12.		18 Zac	1 Kan.
7. 5.		13 Pop	11 Muluc.

18.	13 Chen	7 Muluc.
54. 8.11.14.0.0.	13 Kayab	3 Muluc.
9. 4.	8 Yaxkin	13 Ix.
17.	8 Muan	9 Ix.
10.10.	3 Tzec	6 Cauac.
11. 3.	3 Mac	2 Cauac.
16.	18 Uo	12 Kan.
12. 9.	18 Yax	8 Kan.
55.13. 2.14.0.0.	18 Cumhu	4 Kan.
15.	13 Mol	1 Muluc.
1. 8.	13 Pax	10 Muluc.
2. 1.	8 Xul	7 Ix.
14.	8 Kankin	3 Ix.
3. 7.	3 Zotz	13 Cauac.
4. 0.	3 Ceh	9 Cauac.
13.	18 Pop	6 Kan.
5. 6.	18 Chen	2 Kan.
5.19.	18 Kayab	11 Kan.
6.12.	13 Yaxkin	8 Muluc.
7. 5.	13 Muan	4 Muluc.
18.	8.Tzec	1 Ix.
8.11.	8 Mac	10 Ix.
9. 4.	3 Zip	7 Cauac.
17.	3 Zac	3 Cauac.
10.10.	3 Uayeb	12 Cauac.
11.03.	18 Mol	9 Kan.
16.	18 Pax	5 Kan.
12. 9.	13 Xul	2 Muluc.
56.13. 2.14.0.0.	13 Kankin	11 Muluc.
15.	8 Zotz	8 Ix.
1. 8.	8 Ceh	4 Ix.
2. 1.	3 Uo	1 Cauac.
14.	3 Yax	10 Cauac.
3. 7.	3 Cumhu	6 Cauac.
4. 0.	18 Yaxkin	3 Kan.
13.	18 Muan	12 Kan.
5. 6.	13 Tzec	9 Muluc.
5.19.	13 Mac	5 Muluc.
6.12.	8 Zip	2 Ix.

7. 5.	8 Zac	11 Ix.
18.	3 Pop	8 Cauac.
8.11.	3 Chen	4 Cauac.
9. 4.	3 Kayab	13 Cauac.
17.	18 Xul	10 Kan.
10.10.	18 Kankin	6 Kan.
11.03.	13 Zotz	3 Muluc.
16.	13 Ceh	12 Muluc.
12. 9.	8 Uo	9 Ix.
57.13. 2.14.0.0.	8 Yax	5 Ix.
15.	8 Cumhu	1 Ix.
1. 8.	3 Mol	11 Cauac.
2. 1.	3 Pax	7 Cauac.
14.	18 Tzec	4 Kan.

3. 7.	18 Mac	13 Kan.
4. 0.	13 Zip	10 Muluc.
4.13.	13 Zac	6 Muluc.
5. 6.	8 Pop	3 Ix.
5.19.	8 Chen	12 Ix.
6.12.	8 Kayab	8 Ix.
7. 5.	3 Yaxkin	5 Cauac.
18.	3 Muan	1 Cauac.
8.11.	18 Zotz	11 Kan.

The only places where a year 4 Kan appears are at the dates

55.13. 2.14.0.0.[1]	9 Ahau	18 Cumhu	Year 4 Kan, and
57. 2.14.14.0.0.	9 Ahau	18 Tzec	Year 4 Kan.

But as the words used are that 6 years (or tuns) remained before the end of the katun, and as a slightly longer time than just 6 tuns may have remained, and as the month Zip in which the death of Ahpula occurred is the third month of the year and so is near the beginning of the year 4 Kan, it is quite possible that the beginning of the Tun 14 may have been in the latter part of the preceding year, in which case, in addition to the preceding dates, the following date might be the one which we are seeking:

---

[1] It is necessary to remember that, by Goodman's methods, these figures represent periods of past time. Thus the number 2 of the katun means that 2 katuns have passed, and that the current katun is what we should call the third; and that 0.0 means that a full count of uinals and kins has occurred and that the current uinal and kin are what we should call the first.

55. 9.17.14.0.0. 9 Ahau 3 Zac Year 3 Cauac.

As 9 Ymix 19 Zip is said to be in the year 4 Kan, we shall find this date before the dates of the beginning of Tun 14 in the first two cases and after the beginning of Tun 14 in the last case. This date of 9 Ymix 19 Zip will then be numbered thus, placing the three dates in consecutive order:

1) 55.13. 2.13. 3. 1. 6 tuns 299 days to end of Katun 13 Ahau.
2) 55. 9.17.14.11. 1. 5 " 139 " " " "
3) 57. 2.14.13.16. 1. 6 " 39 " " " "

In no one of the cases is the date 9 Ymix 19 Zip exactly 6 tuns before the end of the Katun 13 Ahau, but it is possible that the annalist took no account of fractions of tuns, either in excess of the 6 tuns or otherwise. Thus in the first and last cases of the three, as first given, he may have said to himself, "There are but 6 whole tuns remaining of the katun and I will call it 6," or in the second case he may have said: "There are 5 tuns remaining and 139 days besides; I will call it 6 tuns." Whichever was the plan he followed, we can have at present no means of ascertaining except from the results which we obtain by calculation.

The date found on Stela 9 of Copan, which is the earliest date of these stelæ of that place, in which the numbers preceding the period glyphs are given by the line-and-dot method, is 54.9.6.10.0.0. This precedes the above dates by the following periods:

1) 0.3.16.3. 3.1. = 548,341 days = 1,502 years 111 days.
2) 1.0.11.4.11.1 = 1,952,861 " = 5,350 " 14 "
3) 2.6. 8.3.16.1 = 4,667,001 " = 12,786 " 111 "

If, now, we accept the first date of 55.13.2.13.3.1. as the date of Ahpula's death, we shall have the date of Stela 9 of Copan as A.D. 34, since the death occurred in 1536. If we accept the second date, 55.9.17.14.11.1., as the true one, Stela 9 must represent a date of B.C. 3814, and in the case of the third date, 57.2.14.13.16.1. in which the period to elapse to the end of Katun 13 Ahau is the nearest to an exact 6 tuns, we should throw back Copan to B.C. 11,250. It is not probable, however, that either of the last two dates is correct, both because of the immense time which would have elapsed and because the monuments show signs of no such age. We are therefore left to the date A.D. 34 as the probable date of the earliest stela of Copan which we know of at present.

The following table gives the earliest and latest dates in Copan and Quirigua as far as we know them, together with the dates of our calendar corresponding thereto, on the supposition that the above date is rightly deciphered :

Copan :	Stela 9,	9. 6.10.0.0			A.D. 34.
	" N,	9.16.10.0.0	= 197	years later than A.D.34	A.D. 231.
Quirigua :	" C,	9. 1. 0.0.0	= 108 +	" earlier " "	say B.C. 75.
	" K,	9.18.15.0.0	= 241 +	" later " "	A.D. 275.

If this is correct, Copan lasted, so far as the erection of stelæ is concerned, for about 200 years, and Quirigua for about 350 years, though of course this may be only a small part of the period of their existence.

The above calculations have been made on the supposition that the initial dates record the date of the erection of the stelæ, and on the further supposition, as has been stated, that the same principle of calculating time has been continued from the earliest ages. There is, however, some evidence that a change has been made, at least in detail. It has already been seen that the beginning day of the month has been shifted from the Eznab, Akbal series to the Cauac, Kan series of days. What difference this would have made in the relation of the year-and-month count with the long count it is impossible to say without knowing the means used to effect the change ; but it is quite likely that this relation was not affected. In the Book of Chilan Balam of Mani is the entry: "The Thirteenth Ahau; then Pop was counted in order." And in the Book of Chilan Balam of Chumayel we find, "The Thirteenth Ahau; Pop was set in order." This statement occurs in the early part of the chronicle, and the calculation of the Ahaus goes on after it in exactly the same way as before it. This setting in order of Pop would not then seem to have made any difference in the long count. At least it is very probable that it means merely that the seasons and the calendar were made to agree.

Dr Brinton (*Maya Chronicles*, p. 85) also gives a translation of a part of the Codice Perez, which refers to the "Doubling of the Katuns." The statement is very obscure, but only tends to show that while the counting of the katuns was carried on as in the Books of Chilan Balam, the first of the series was called Katun 8 Ahau instead of Katun 13 Ahau, while the last of the series was Katun 10 Ahau. This would not necessarily change the consecutive order of the katuns, but might merely give a new starting-point.

While, therefore, it is impossible to say what change, if any, was made in the reckoning of time, it may be said that there is no evidence at present to show that the old relation of the long count to the year-and-month count and to the count of the Books of Chilan Balam did not continue to the time of the arrival of the Spaniards. Moreover, the date of A.D. 34 for the monuments of Copan and Quirigua is by no means unlikely to be the true one. At all events the above discussion of the reckoning will not be useless if it succeeds in bringing out new facts, and no one will be more ready to recognize any new evidence than I shall be, even if the above deductions shall be shown to be erroneous.

THE ILL HEALTH OF CHARLES DARWIN: ITS NATURE AND ITS RELATION TO HIS WORK

BY W. W. JOHNSTON

EVIDENCE OF THE EXISTENCE OF ILL HEALTH

No one can read the story of Darwin's life without being impressed with the frequent allusions to his ill health. In his *Autobiography*, in the *Reminiscences* written by his son, and in the collection of his letters these allusions are met with on almost every page. From the three sources mentioned I have abstracted forty-two pages of type-written matter which refer directly to this subject. The following quotation from the *Reminiscences* is a full and very clear statement of the state of Darwin's health:

> If the character of my father's working life is to be understood, the conditions of ill health under which he worked must be constantly borne in mind. He bore his illness with such uncomplaining patience, that even his children can hardly, I believe, realize the extent of his habitual suffering. In their case the difficulty is heightened from the fact that from the days of their earliest recollections they saw him in constant ill health. . . . It is, I repeat, a principal feature of his life, that for nearly forty years he never knew one day of health of ordinary men, and thus his life was one long struggle of the weariness and strain of sickness.

Darwin's letters to his scientific friends are full of references to persistent suffering and to the interruptions and delays that were caused by continued illness. The above extract, with others which the limits of this paper will not permit me to quote, show the continuity and extent of these sufferings from the year 1836, the date of his arrival in London after the *Beagle* voyage, until his death on April 19, 1882, a period of forty-six years. The story of these years is one of intense application to work and of unremitting suffering, and it was while reading the *Autobiography* that I became anxious to know the nature of this illness that lasted nearly half a century, an illness so severe as to make life a burden and yet which did not shorten life nor prevent the completion of the great work which made Darwin's name immortal.

Various opinions have been expressed by the friends of Darwin as to the nature of his illness. His continued sufferings were said to have been the result of prolonged seasickness and of inherited dyspepsia, but no rational or complete diagnosis of his disease with an explanation of its causes is on record. To give a name to the assemblage of symptoms so fully described in the *Autobiography* and the *Reminiscences* is the object of this paper.

HISTORY OF DARWIN'S ILLNESS

From the quotation given above it is clear that Darwin was ill and suffering during the whole of his working life, and especially during that period of it in which his best work was accomplished. But before attempting a diagnosis of his illness it is necessary, of course, to know something of its history and to study the character of the symptoms distinguishing it.

In early life Darwin was strong, much given to outdoor life and in the latter part of his school days passionately fond of shooting. "I don't believe," he says, "that any one could have shown more zeal for the most holy cause than I did for shooting birds." His father told him that "he cared for nothing but shooting, dogs, and rat catching."

His strong constitution and large frame he inherited from his father's family, which he most closely resembled. His grandfather, Dr Erasmus Darwin, died at 71, his father, also a physician, at 82, bequeathing to their descendant a tendency to long life. From them, too, he no doubt received in part at least the great brain capacity to which all his portraits bear witness.

By his unappreciative teachers he was considered an ordinary boy, though he "had strong and diverse tastes, much zeal for what interested him, and a keen pleasure in understanding any complex subject or thing." Natural objects interested him most, and this fact, perhaps, as well as the influence of father and family sent him to Edinburgh to study medicine. Attendance upon two very severe operations from which he rushed before their completion convinced him that he could never be a physician. This discouragement was hardly justifiable, and yet it is fortunate for science that his life was not confined to a strictly professional career.

The taking of clerical orders was considered by his father next best to the practice of medicine, and he was sent to Cambridge to start afresh and to make preparatory studies with this in view. "Here," he says, "the time as far as academical studies were concerned was as thoroughly wasted as at school and in Edinburgh." No pursuit was followed with half the eagerness and none gave him so much pleasure as collecting beetles, and his studies for the ministry made little headway.

The three years at Cambridge were, he thought, the most joyous of his life because "he was in excellent health and always in high spirits." Up to this time there had been no sign of ill health; his brain had not been taxed, and with the exception of collecting beetles and shooting birds he had done little serious work.

To those, however, who could appreciate him he had already shown the promise of his mind, and to Professor Henslow, who recommended him for the position of naturalist to H.M.S. *Beagle* on her projected voyage of study and discovery, is due the honor of having launched Darwin upon his career. Captain Fitzroy's objection to the shape of Darwin's nose was not allowed to stand in the way, and after some little hesitation the young man accepted the appointment and took the most important step of his life.

It was at Plymouth, while waiting, much depressed in mind, for the sailing of his ship, that the earliest symptoms in the long train which followed him through life first appeared. These symptoms were palpitation and pain about the heart. He was then 22 years of age, and it is easy to understand how, at this age, the mingled feelings of excitement and gloom on leaving home should have caused such nervous disturbances. He thought, however, that he had disease of the heart, but because he "expected to hear the verdict that he was not fit for the voyage," he would not see a physician. His ambition "to take a fair place among scientific men" urged him to go at all hazards and he sailed for South America two days after Christmas day, 1831.

During this voyage of five years we have no knowledge of Darwin's health except from himself, and his journal contains but few references to the subject. He speaks of being ill, of occasionally feeling so exhausted as to be compelled to rest, but there is no definite statement of symptoms. His power of endurance was evidently very great at this time, and it is mentioned by his son that, on the occasion of a shore excursion when all were suffering for want of water, Darwin "was one of the two who were better able than the rest to struggle on in search of it."

His son alludes to only one serious illness in South America. In this attack Darwin said that every secretion of the body was affected, but the symptoms were so ill-defined that his father, Dr Darwin, could not make a guess as to their nature.

The voyage began December 27, 1831, and ended on October 2, 1836. During the two years and three months between this latter date and his marriage in 1839, he was occasionally unwell. From his marriage until the date of his leaving London, a period of nearly three years, he had frequently recurring illnesses, one of them long and serious. He was losing ground year by year, and a geological excursion in Wales was the last that he had the strength to make. Increasing weakness, the inability to meet his scientific friends, to attend society meetings, and at the same time to carry out his plan of scientific work made him take the resolution to leave

London forever and to live in the country. This decision, next in importance to the *Beagle* voyage, had the most far-reaching influence on his life. Out of it grew the ability to complete *The Origin of Species* and the rest of his marvelous contributions to science.

The symptoms that appeared after settling at Down, his country home, are more characteristic than any before described in the *Autobiography*. They followed the excitement of receiving and conversing with friends and consisted of violent shivering with vomiting and giddiness. At times he was so giddy as to need an alpenstock to steady him even in the house. He was very sensitive to both heat and cold; if anything went wrong with his work he would complain of a sense of oppression from heat.

Insomnia was one of the most constant and most distressing of his symptoms. This varied with circumstances—"half an hour more or less conversation would make to him the difference of a sleepless night and of the loss perhaps of half the day's work." "He often lay awake or sat up in bed for hours, suffering much discomfort from the activity of his thoughts . . . his mind working at some problem which he would willingly have dismissed." Any departure from the regular routine of his life upset him, and he paid the penalty of suffering for every infraction of his self-ordered regime. "Anything that flurries me knocks me up afterwards and brings on a violent palpitation of the heart"—he wrote to a friend.

The early morning was the only time when he could make any exertion. "Towards evening his step was slow and labored, and mounting the steps was an effort."

Darwin soon learned to know that for increasing suffering there was but one remedy—a complete abandonment of all writing and absence from home and study. Thus began the habit of taking holidays. When about to leave home the making ready and the anticipation of the journey caused "a miserable, sinking feeling" that gave great disquiet but passed away as soon as the journey was begun.

As the years went by all invitations were refused; social life was practically given up and he rarely felt well enough to receive visits from scientific friends.

The allusions in his diary to the condition of bad health increased with the years and the holidays became longer and more frequent. In the earlier years fluctuations occurred, and at times he speaks of gaining ground, but by 1846 he was usually hopeless and much depressed by continued sleeplessness, indigestion, and prostration. By 1852 he rarely ever went to London, and during the succeeding years he was never free for a day from suffering. In 1859 he wrote that his health had "quite failed," that he had great prostration of mind and body, bad headaches, with frequent attacks of acute exhaustion; his work is spoken of as a burden from which he would gladly be freed. He was then often confined to the house for weeks at a time; he suspected that he would soon entirely fail and believed that he must husband the little strength left in order to finish his work. Everything unusual disturbed him; a conversation of two and a half hours with his nephew made him ill half the night. In 1863 he wrote that he had been very busy and uncomfortable from a feeling of fulness, slight pain, and tickling about the heart. These symptoms with those previously described continued during 1860, 1861, and 1863. In 1864 appears the entry, "Ill all January, February, March."

There is very little doubt that these casual allusions to illness during these 27 years do not give an exaggerated picture of the suffering endured. Nor does the calm and well-balanced mind of Darwin justify the belief that the symptoms were imaginary, that he was simply an intellectual hypochondriac, distorting his feelings and creating pain where none existed. There is the positive testimony of his son that he suffered from insomnia, vertigo, an abnormal sensibility to heat and cold, dizziness, vomiting, sensations of distress about the heart, chronic indigestion, and prostration chiefly affecting the nervous system after mental strain. Monotony benefited him; unusual excitement broke him down.

His symptoms bore a close relation to the amount and character of his work; overwork or a long continuance of moderate work made him ill; rest from work made him better. But there was no radical improvement at any time; the changes for the better were only temporary; and he was pursued during the 27 years by a feeling of hopelessness and the dread that he would not live to finish the great task he had set himself to do. It is, however, a significant fact that he did live, not wasting much, preserving a fair amount of nutrition as his pictures show, and working with undiminished ardor and success during all this time.

The year 1864 was marked by a temporary improvement; but the change was without much effect on his despondency, as in this year he wrote: "I wonder so old a wornout dog as I am is not quite forgotten." The following year began with less ill health, for he seems to have given himself up to a greater degree of rest from work than before. From April to December he did practically no work with the exception of looking over *The Origin of Species* for a second French edition.

Through 1866 his health improved and in 1867 he wrote that he had rested and felt more himself. In this year he was busy with *The Descent of Man*, a work that exhibits the greatest industry and the fulness of his genius, and yet he was far from well, for on a visit to London he failed to keep half his engagements and was confined to the house for some time. On a visit to Wales in the same year he was ill and saddened because of his inability to wander over the hills as he had once done. He wrote a friend at this time: "I have been as yet in a very poor way; it seems as soon as the stimulus of mental work stops my whole strength gives way. As yet I have hardly crawled half a mile from the house, and then have been fearfully fatigued. It is enough to make one wish oneself quiet in a comfortable tomb." This is the story of the next two years. In June, 1870, he wrote that he had been better of late. In the next year he speaks of discomforts and miseries and of the inability to hear even much reading aloud.

Darwin was now, in 1872, sixty-three years of age. For th first time since the beginning of his illness a marked change fo the better appeared, and during the last ten years of his life— from 1872 to 1882—"the condition of his health was a cause o satisfaction and hope to his family." His health showed signs o amendment in several particulars. There was less distress an discomfort, and he was able to work more steadily. It is a fai conclusion that this improvement was in great part due to th wise counsel of Sir Andrew Clark, who was at this time frequentl consulted. His son says: "It was not only for the generousl rendered service that my father felt a debt of gratitude toward Sir Andrew Clark. He owed to his cheering personal influenc an often repeated encouragement, which latterly added somethin real to his happiness, and he found sincere pleasure in Sir Andrew' friendship and kindness towards himself and his children."

These last years were marked, then, by a general improve ment. Work was continued intermittently. The symptoms con nected with the nervous system were less distressing, but ther was a certain loss of physical vigor with more frequent attacks o pain or uneasiness about the heart. He speaks at this time o the wearisomeness of life and of approaching death. On the 13t of December, 1881, he had the first of a series of attacks o angina pectoris. Irregularity of the pulse followed with attack of faintness. In April, 1882, these symptoms were aggravated and fainting attacks, from which he recovered with difficulty, re curred. During the night of the 18th there was a severe attac of this kind. He recognized the approach of death and said, " am not in the least afraid to die." After much suffering fro nausea and faintness death came on the next day, April 19, 1882 He was in his seventy-fourth year.

The life of Darwin can be divided into four periods, each on characterized by a different condition of health:

1. From birth to the age of 22. He was at this time i

excellent health, active-minded with keen sensibilities, devoted to outdoor life and exercise.

2. From the age of 22 to 27 — the period covered by the *Beagle* voyage. He was then strong, capable of bearing great physical fatigue, but taxing his mental and physical endurance to the utmost. Rare and sudden illnesses occurred, brought on by unusual strain on mind and body.

3. From his return to England in 1836 to 1872. This period of thirty-six years represents the time of his most severe suffering and of the accomplishment of the greatest part of his work; there were fluctuations, but he was never well.

4. From 1872 to 1882. A notable improvement in the nervous symptoms which had made life miserable and work difficult marked this period. He was less despondent, worked more easily, and we do not read of the distressing insomnia, exhaustion from conversation, indigestion, and other causes of suffering so frequently mentioned in the preceding years. At this time he developed new symptoms, however, which took the place of those enumerated. These were clearly due to atheromatous and senile changes in the heart and vessels. With advancing years, angina pectoris and accompanying cardiac exhaustion led to his death in 1882.

CAUSES OF DARWIN'S ILL HEALTH

1. *The Voyage of the Beagle.*—The voyage of the *Beagle* was the real beginning of Darwin's intellectual life. It awakened new and exciting interest in a new and congenial sphere and aroused all the dormant energy of his strong mind. No one can read his *Journal of Researches* without realizing how great was his mental activity during those five years and how intensely he was stimulated by his new and vast experience. He was here brought face to face with all the physical and biological problems of the day and he had leisure to ponder on every phase of the phenomena observed, free from the distractions of society and from the influence of other minds. All the conditions then existed most

favorable to the formation of habits of original thought, and *The Origin of Species* first saw light in the cabin of the *Beagle*.

The exercise of his mind, however, was not with Darwin altogether along normal lines; it was the inherent tendency of his nature to overstrain his faculties. His work on the *Beagle* was always overwork; his nervous system was always inevitably and unavoidably overtaxed.

As the naturalist of the expedition all the work in botany, zoölogy, and geology fell upon him. The range of his work was therefore very wide and very exacting; it was his part to collect specimens connected with all these departments, to keep full notes of all phenomena observed, to work with the microscope, and to study the countries and peoples visited. A very severe task this was for a young man of 22 to 25 years; how well he profited by his opportunities his *Journal of Researches* and his after life show.

Besides the mental overstrain involved in such work there were the wear and tear of the physical discomforts of ship life with the fatigue of long land journeys and the exposure to the influence of heat and cold in many different climates. Admiral Lord Stokes, who as a midshipman was one of the *Beagle* ship's company, wrote in 1883:

> Perhaps no one can better testify to his early and most trying labors than myself. We worked together for several years at the same table in the poop cabin of the *Beagle*, during her celebrated voyage, he with his microscope and myself at the charts. It was often a very lively end of the little craft, and distressingly so to my old friend who suffered greatly from sea-sickness. After perhaps an hour's work he would say to me, "Old fellow, I must take the horizontal for it," that being the best relief position from ship motion; a stretch out on one side of the table for some time would enable him to resume his labors for a while, when he had again to lie down. It was distressing to witness this early sacrifice of Mr Darwin's health, who afterwards seriously felt the ill effect of the *Beagle's* voyage.

The physical fatigue to which Darwin subjected himself when on shore at the various ports where the *Beagle* stopped was very great; his incessant activity and the desire to see and know everything impelled him to take long journeys which often involved very great hardships. From Rio he started on a horseback journey of a hundred miles; ten hours were sometimes passed in the saddle without rest, and he arrived at the end thoroughly exhausted with hunger and fatigue. In the same month he rode seventy miles, and in the next month made a journey of eighty miles. Food was difficult to obtain in traveling through this sparsely-settled country, and he often suffered from hunger. In the following year he rode four hundred miles on horseback through an uninhabited country to Buenos Ayres, climbing rugged mountains, exposed to cold and wet, and living for days on meat alone. Seven days after the completion of this journey he began an excursion to Santa Fé, three hundred miles distant. At the end of six days he arrived at his destination, went to bed with headache, and was not well enough to continue.

Every opportunity was seized to climb high mountains, visit distant localities of interest, and to study the general features of the fauna and flora of every country. At one time he traveled for three hundred miles in an open boat off Tierra del Fuego, but he was always stimulated to increased activity, he says, by the novelty of objects and the chance of achieving success. It was this enthusiasm that urged him during the five years of absence to bear every discomfort and to strain every energy to the uttermost.

It is a curious coincidence that, like two other leaders of science, Charles Darwin and Joseph Dalton Hooker, their close friend Huxley began his scientific career on board one of Her Majesty's ships. Huxley writes:

> Life on board Her Majesty's ships in those days was a very different affair from what it is now, and ours was exceptionally rough, as we were often many months without receiving letters or seeing any civilized peoples besides ourselves. . . . But apart from experiences of

this kind the opportunities afforded for scientific work, to me personally, the cruise was exceedingly valuable. It was good for me to live under sharp discipline ; to be down on the realities of existence by living on bare necessities; to find out how extremely well worth living life seemed to be when one woke up from a night's rest on a soft plank, with the sky for canopy, and cocoa and weevilly biscuit the sole prospect for breakfast; and more especially, to learn to work for the sake of what I got for myself out of it, even if all went to the bottom and I with it.

The effect of these hardships upon health was quite different in the case of the two men, Huxley and Darwin.

2. *Continued Work after the Beagle Voyage.*— The discomforts, fatigues, and mental overstrain of the *Beagle* voyage can fairly be set down as the initial cause of Darwin's subsequent invalidism. Were these causes sufficient to produce such a train of serious and long-continued symptoms ? A closer examination of the details of Darwin's life with the clues here given will convince the most doubting that when he landed in England his nervous system was exhausted and that he was in need of immediate and prolonged rest and recuperation. But he took no such rest. On arriving in London he at once began a life which he speaks of as the most active he had ever spent, when he worked " as hard as he possibly could " although interrupted by frequently recurring illnesses and one long and serious illness. The state of impaired health was now firmly established. From this time the initial causes were continued in the persistent overstrain to which he subjected himself. Although conscious of weariness, he continued to tax his nervous system to the utmost, and even beyond its strength. The necessary result of all this was to multiply many times the original acquired exhaustion and to create a condition that was permanent and from which he never fully recovered.

To give some idea of the sufficiency of the causes in Darwin's life after his return, to cause the symptoms that have been enumerated, I will briefly mention some of the work done by him.

He began almost immediately in July, 1837, having returned in October, 1836, to take notes in relation to the origin of species, and this work was continued uninterruptedly for the next twenty years. He began the book on *Coral Reefs* which caused him twenty months of hard work. He also, while residing in London, read papers before the Geological Society on the *Erratic Boulders of South America*, on *Earthquakes*, and on the *Formation of Mould by the Agency of Earth Worms.* He superintended also the publication of the *Zoölogy of the Voyage of the Beagle.* His three geological books, *Coral Reefs* included, "consumed four and a half years of steady work." After reaching Down he began work on the subject of *Cirripedia;* this work, in two thick volumes and two thin quartos, required eight years to finish. Two years of the eight, however, were lost by illness. From September, 1854, he devoted his whole time to collecting and arranging notes on the origin of species and to reading books, journals, and transactions bearing on the subject. In November, 1859, was published *The Origin of Species;* this book cost him, he says, thirteen months and ten days of hard labor. During this and the following five years he published seven papers on botanical subjects. One paper alone required four months of work. The *Variation of Animals and Plants under Domestication* appeared in 1868 and cost him, he says, four years and two months of hard labor. *The Descent of Man* was published in February, 1871; this book took him three years to write, constant interruptions occurring from ill health and from the frequent demands for new editions and minor works.

During his lifetime Darwin was the author of twenty-three distinct and important works. This does not include new editions and reviews nor the works which he edited and superintended through the press. He also published fifty-one papers and communications to scientific journals. Nine books by other authors contain contributions by him.

Week-days and Sundays were alike; there was no break in the regularity of his life. The pains he took in the preparation of his manuscript was remarkable; composition was not easy with him, and everything was prepared in the rough and then rewritten and the style and phraseology corrected.

Besides the collecting of material and the writing of books he was in constant correspondence with friends, men of science all over the world, and with all sorts and conditions of men to obtain information to help him in solving the question of the transmutation of species. This correspondence involved much fatigue and required much of his time.

Those who have read *The Origin of Species*, *The Descent of Man*, or *The Expression of the Emotions in Man and Animals* can appreciate the time and labor spent by Darwin in the accumulation of facts by extensive reading, correspondence, and observation.

NATURE OF DARWIN'S ILLNESS; INFORMATION DERIVED FROM THE EFFECTS OF TREATMENT

Much light is thrown on the nature of Darwin's illness by the enforced remedial measures that were adopted by himself in order to enable him to continue his work and to prevent a complete breakdown. There is also something to be learned from the effect of the treatment suggested by physicians.

During Darwin's residence of three years and eight months in London he worked very hard, as has been stated, completing his book on *Coral Reefs*, reading extensively, and preparing papers on various scientific subjects; the systematic collecting of facts bearing upon the origin of species was also continued. He also went into general society, attended as regularly as he could the meetings of several scientific bodies, and acted as secretary to the Geological Society. This exacting work and especially the demands of ordinary social life had so bad an effect upon his health that he decided to abandon London and live in the country Very little is known as to what part a physician's advice played in this important decision, but from the fact that about this time he consulted Sir Andrew Clark, who advised complete rest from work, it is probable that the removal to the country was a measure of compromise, securing a certain amount of rest and freedom from many fatiguing obligations with the ability to continue his projected task. At Down he escaped all the social distractions and interruptions that must have worn upon him so much in city life. There was very little real gain, however, from the change. He adopted a daily routine, and made an effort to go a little into society and to receive friends, but the more serious nervous disturbances that have been spoken of soon appeared. One thing after another in his social life was given up—dinner parties, the visits of friends, and excursions to London—so that finally his life became devoted to scientific work only, which, to use his own words, was "his chief enjoyment and sole employment."

The increase of weakness and sleeplessness with other nervous symptoms and their relation to the number of hours spent in work convinced Darwin that he could not keep up his early habits of work, and that in order to preserve a minimum amount of health it would be necessary to reduce the number of hours given to writing. Acting upon this idea he began the habit, which he continued throughout the remainder of his life, of devoting not more than two to four hours daily to actual work in his library. His son gives the following description of his father's daily routine:

> He rose early chiefly because he could not lie in bed, and I think he would have liked to get up earlier than he did. He took a short turn before breakfast. . . . After breakfast alone about 7:45, he went to work at once, considering the one and a half hour between 8 and 9:30 one of his best working times. At 9:30 he came into the drawing room for his letters—rejoicing if the post was a light one and being sometimes much worried if it was not. He would then hear any family letters read aloud as he lay on the sofa.
>
> The reading aloud, which also included part of a novel, lasted until half past ten, when he went back to work until twelve or a quarter past. By this time he considered his day's work over and would often say, in a satisfied voice, "I've done a good day's work." He then went out of doors whether it was wet or fine.
>
> The midday walk began by a call at the greenhouse ; then he went

on for his constitutional—either round the sand-walk or outside his own grounds in the immediate neighborhood of the house. . . . He took as many turns as he felt the strength for. . . . Luncheon at Down came after his midday walk. . . . After his lunch he read the newspaper, lying on the sofa in the drawing room. . . . I think the paper was the only non-scientific matter that he read to himself. Everything else . . . was read aloud to him.

After he had read his paper came his time for writing letters. . . . When letters were finished about three in the afternoon, he rested in his bed room lying on the sofa smoking a cigarette and listening to a novel or other book not scientific. . . . The reading aloud often sent him to sleep. . . . He came down at 4 o'clock to dress for his walk and he was so regular that one might be quite certain it was within a few minutes of four, when his descending steps were heard.

From half past four to half past five, he worked; then he came to the drawing room and was idle until it was time (about 6) to go up for another rest with novel reading and a cigarette.

Latterly he gave up late dinner and had a simple tea at half past seven. . . . with an egg or a small piece of meat. . . . After dinner he played backgammon with my mother, two games being played every night. . . . He became extremely animated over these games, bitterly lamenting his bad luck and exploding with exaggerated mock anger at my mother's good fortune. After backgammon he read some scientific book to himself and afterwards there was some reading aloud.

He became much tired in the evening, especially of late years. He left the drawing room about ten, going to bed at half past ten. The restless nights which followed have already been described.

I have quoted in full this record of Darwin's daily routine, as it shows that he lived always under a modified form of rest treatment, just such as is now advised for cases like his.

The day's program was as follows: 7:45, breakfast; 8 to 9:30, work in his study; 9:30 to 10:30, rest in the recumbent position with reading aloud; 10:30 to 12, work in his study; 12 to 12:30, short walk out of doors; 12:30, luncheon; 1:30 to 2, rest in the recumbent position; 2 to 3, writing of letters; 3 to 4, rest lying down in bedroom, with reading aloud and sleep; 4 to 4:30, a short walk out of doors; 4:30 to 5:30, work in his study; 6 to 7, rest in bedroom and reading aloud; 7, simple supper; 8 to 10, in drawing room, games, reading, etc.; 10:30, in bed.

These rules, it will be seen, allow five hours to what may be called work, including letter-writing, this being divided into four periods of an hour to an hour and a half in length; there were three and a half to four hours of rest during the day, lying down, the time being divided into four periods of about one hour each. There were two short outings of one hour or an hour and a half in the morning and about the same time in the afternoon. Eight hours and a half were spent in bed at night.

I have no doubt that this well-ordered routine was the outcome of many a painful experience. Darwin, we may be sure, discovered early that the alternation of work and complete rest was essential to the prosecution of his studies. The problem was how a man suffering with such symptoms could best continue an arduous life of intense mental application during the many years necessary to complete a great task. Darwin certainly solved the problem; the task was completed in spite of suffering and exhaustion.

If this rule of life, which was the means by which he succeeded, was the result of his own decision, it is only another evidence of his good judgment; if it was the advice of a physician, he must have had a wise counsellor.

Something should be said of certain subsidiary parts of treatment made use of by Darwin — his diversions, holidays, etc. Novel-reading was his great recreation during the hours of rest; even to advanced age he never tired of romances. "A novel," he says in his *Autobiography*, "according to my taste does not come into the first class unless it contains some person whom one can thoroughly love, and if a pretty woman all the better." The conservation of this taste for novels is strange inasmuch as he lost during the latter years of his life all love for poetry, even for that of Shakespeare, in whom he had taken intense delight in his earlier years.

"His only outdoor recreation besides walking was riding, which he took to on the recommendation of Dr Bence Jones." He continued riding until two accidents upset his nerves so that he was advised to give it up. He was fond of music and singing and was diverted by them after dinner. He smoked in moderation and used wine sparingly.

Holidays were forced upon him by the frequency of "bad days" or by the swimming in his head, which told him he was being overworked. He usually went to London, Coniston, Grasmere, or Southampton, and was rarely absent more than a week.

Much relief was experienced by visits to water-cure establishments. At first he thought that "a cure had been found, but, like all other remedies, it had only a transient effect on him."

I have reserved until the last one of the most important helps that Darwin had. Without the faithful and untiring assistance of his wife and children no work could have been done; otherwise his life would have been a wreck. These women of the family ministered to his hourly needs, brought him food, read to him, warded off all annoyances, and in his daily life kept in quiet motion the machinery that was absolutely essential to his needs. No tribute to Darwin's accomplished tasks can justly omit to give this credit to those who did so much to preserve his strength during these many trying years.

The conclusion to be drawn from the consideration of the influences favorable to Darwin's health is that he was benefited by lessening his work and increasing his rest. He was enabled to live and to prevent the breaking of his thread of life only by relieving the tension at the critical moment.

CONCLUSION

After this review of Darwin's symptoms and of the conditions that preceded and accompanied them, as well as of the modifications they underwent under the influence of work and rest, there can be but little difficulty in reaching a conclusion as to their nature. This conclusion may be expressed as follows:

1. Darwin was strong and in perfect health up to the beginning of the *Beagle* voyage.

2. The history of the voyage shows that all the conditions were such as to lead to an overstrain of the brain and nervous system and that his expenditure of energy was in excess of the normal supply. The mind was overtaxed with excess of work and the body was fatigued by discomforts and extreme exertions.

3. After returning home he continued to be subjected to mental overstrain during the remainder of his life, a period of forty-six years. There was during this time the intense and sustained application of the mind to a series of investigations requiring the exercise of faculties of the highest order as well as the greatest energy and physical endurance.

4. A state of disease characterized by symptoms connected with the brain and nervous system, the digestion, and the heart was manifested on his return to England. These symptoms were intensified as the years went by, and although sometimes lessened they were never entirely relieved, their fluctuations bearing a close relation to the alternations of rest and work. In their general character they belong to the category of "fatigue symptoms" and were due to the continued overstrain of exhausted nerve cells. They never, however, rendered the cerebrum incapable of the highest intellectual work, although making the accomplishment of this work both painful and difficult.

5. The disease did not consist of any gross lesions of the brain, spinal cord, or nerves, inasmuch as there were no symptoms of any such change. Moreover, the symptoms continued without great alteration during thirty-six years, and under the influence of rest and proper diet improved greatly toward the end of life. This could not have happened had there been any organic nervous disease.

6. The disease was clearly not due to any organic change outside of the nervous system. The chronic indigestion and disturbances in the action of the heart were the usual well-recog-

nized accompaniments of loss of the normal nerve supply to the digestive organs and the heart.

7. The symptoms that preceded death were manifestly due to senile arterio-sclerotic changes, leading ultimately to heart exhaustion and angina pectoris and hastened no doubt by the life of excessive labor. They did not exist, however, before the oncoming of old age. The early symptoms connected with the heart were the result of the disease of the nervous system, not of any organic change in the heart or arteries.

8. The final conclusion is that Darwin's disease was chronic neurasthenia of a severe grade due first to the overstrain of the *Beagle* voyage and second to the life of hard intellectual work begun in 1837 and continued until 1882.

If this diagnosis be the correct one, and of this I think there can be no doubt, could the result have been different from what it was? Was it possible to have prevented all this suffering? The nature of Darwin's work and of Darwin himself necessarily would have made his labor of production a painful one. Such great original thoughts could not have been born without some agony. And yet if Darwin had on his return from the voyage given up all work for one year, two years if necessary, and had lived a life of rest and diversion, free from the daily toil of writing books, correcting proofs, and correspondence, I believe a cure would have been brought about and his subsequent life more filled with joy and alleviation than it was. It will be said with some truth that Darwin's brain could not be made to rest, that in the Alps or on the Riviera he still would have been the observer and worker. But if rest and relaxation had been enjoined upon him as a duty, a relative rest could have been had, free at least from the demands of the printer and of his own exacting conscience.

It is too late now to regret that this course was not adopted and that so much suffering followed its neglect. It only enhances the value of Darwin's work to know that the truth as it came from him was created for us and for all posterity at so great a cost.

GEORGE MERCER DAWSON

GEORGE MERCER DAWSON

GEORGE M. DAWSON, C.M.G., LL.D., F.R.S., Director of the Geological Survey of Canada and an editor of the *American Anthropologist*, died on March 2, in his fifty-second year, of acute bronchitis, after an illness of but a few hours. In his death Canada loses her leading scientist, and North America one of her foremost geologists.

George Mercer Dawson was born at Pictou, Nova Scotia, August 1, 1849. His father, Sir J. William Dawson (who died in 1899), long known as principal of McGill University and still more widely known as the author of standard works on geology, archeology, and related topics, was Canada's most eminent scientist for decades; his mother, Lady Dawson (Margaret A. Y. Mercer), representative of a distinguished Edinburgh family, still occupies a prominent place in that scientific and educational circle in Montreal which grew up under the influence of her honored husband. Born with the best physical and intellectual endowments, young Dawson suffered a nearly fatal accident (involving a fracture of the spine) in infancy, which arrested bodily growth and resulted in permanent deformity; yet the misfortune was so far counteracted by early treatment and training, and so far overcome later by inherent vigor, that its victim achieved distinction in his maturity as one of Canada's hardiest explorers, while his intellectual accomplishments could hardly have been enhanced by any physical advantages.

Dawson's earlier education was acquired partly in Montreal, partly in Edinburgh; later he took a partial course in McGill University, followed by a course in the Royal School of Mines (London), 1869–1872, where he not only graduated with honors but took the Duke of Cornwall scholarship and the Edward Forbes prize, and received the highly-prized title of Associate. Returning to Canada, he began original researches in geology. In 1873 he was appointed geologist and botanist of the British North American Boundary Commission, and his report is one of the classics of Canadian geology. In 1875 he was appointed on the staff of the Canadian Geological Survey, and entered on a remarkable career of exploration of northwestern North America; his work including extended reconnaissances of the Liard and Yukon valleys, of the Canadian Rocky mountains, and of British Columbia. During these travels and researches he came in frequent contact with aboriginal tribes, and did excellent work in recording their characteristics and customs and in collecting their languages. In 1883 he was made Assistant Director of the Geological Survey Department; in 1891 he became a fellow of the Royal Society of England, and during the same year received the Bigsby medal for eminent researches in geology. In 1891 and 1892 he served as one of the British Bering Sea Commissioners, for which service he was decorated by the late Queen and Empress Victoria with the order of Companion of Saint Michael and Saint George; and about the same time degrees were conferred on him by McGill University and Queen's College. In 1893 he was elected president of the Royal Society of Canada; on the retirement of Sir Alfred Selwyn in 1895, he was appointed Director of the Geological Survey; and when an Ethnological Survey of Canada (modeled after the Ethnographical Survey of the United Kingdom and thus after the Bureau of American Ethnology) was instituted in 1896, he was placed at the head of the Survey Committee.

It falls to few men to have so many high honors and grave responsibilities thrust on them in so short a period; the succession is probably without parallel in Canada's history; yet it is the common judgment that the honors were fully merited, the responsibilities borne in such manner as to add renown to the country and the crown. Dr Dawson's career was a credit to Canada, and an eloquent testimony to the wisdom of the nation in recognizing and utilizing the talents of her sons.

One of Dr Dawson's earliest contributions to ethnology was a memoir on the Haida Indians of Queen Charlotte islands, published in the form of an appendix to the Report of the Geological Survey of Canada for 1878–79 (pp. 103–189, pls. III–XIV); a contribution made noteworthy by the novelty and extent of the observations and the comprehensiveness of the record. Four years later he, in association with W. Fraser Tolmie, prepared a valuable series of "Comparative Vocabularies of the Indian Tribes of British Columbia, with a Map Illustrating Distribution," which were published by the Geological Survey in 1884; and he appended a valuable series of notes on the aborigines of the Yukon district and adjacent territory to the Survey Report of 1887–88 (pp. 191–213). About the same time he prepared for the Royal Society of Canada a memoir on the Kwakiutl people of Vancouver island and adjacent coasts, with an extended vocabulary (Trans. Roy. Soc. Can., vol. V, sec. II, 1887, pp. 1–36, with plate); and still more comprehensive was his subsequent memoir entitled "Notes on the Shuswap People of British Columbia" (ibid., vol. IX, sec. II, 1891, pp. 3–44, pl. vi). A "Note on the Occurrence of Jade in British Columbia, and its Employment by the Natives" was published in 1887 in the *Canadian Record of Science;* and a summary sketch of the "Past and Present Condition of the Indians of Canada" appeared in the *Canadian Naturalist*, vol. IX, 1881. In 1884 the British Association for the Advancement of Science appointed a committee to investigate the physical characters, languages, and industrial and social condition of the northwestern tribes of Canada, of which committee Dr Dawson was made a member; and by reason of previous familiarity with the subject, acquaintance with territory and tribes, and presence on the ground, it naturally fell mainly to him to organize and administer the work of the committee. The work was carried forward with great economy under small grants, and the reports of the collaborators (among whom

Dr Boas deserves especial mention) were published annually up to the institution of the more formal survey in 1896.

While several of Dr Dawson's titles and the prefatory remarks in some of his papers imply that his ethnologic researches were subsidiary to his geologic work, and while his busy life never afforded opportunity for monographic treatment of Canada's aborigines, it is nevertheless true that he made original observations and records of standard value, that much of his work is still unique, and that his contributions, both personal and indirect, materially enlarged knowledge of our native tribes. It is well within bounds to say that, in addition to his other gifts to knowledge, George M. Dawson was one of Canada's foremost contributors to ethnology, and one of that handful of original observers whose work affords the foundation for scientific knowledge of the North American natives.

Primarily a geologist, Dawson did his work in such wise as to aid in the solution of fundamental problems in archeology, and so to illumine various aspects of anthropology. When he returned from the Royal School of Mines to the land of his nativity, he found the geologists of Canada and the United States at issue concerning the later periods and episodes of geologic history. The differences were natural; they grew out of the fact that each group of earth-students began with the phenomena of their respective fields—those of Canada with late-glacial, aqueo-glacial, and glacial deposits only, those of the United States with earlier glacial deposits chiefly—and extended inference too far into the neighboring field; yet the differences were none the less unfortunate and obstructive of progress. Young Dawson wisely avoided controversy, but gradually extended observation over the more northerly field, gradually systemized knowledge of the Pleistocene history of the northland, gradually brought the stern logic of facts to bear on the general interpretations, and in this manner contributed more than any associate—probably more than any contemporary—toward harmonizing the discrepant readings of the records of rocks and ice. Today the leading geologists of Canada and northern United States are practically at one as to the later episodes of earth-making; they are in substantial agreement as to the geologic time-scale by which the antiquity of man on the western hemisphere is to be measured; and for this happy condition they are indebted to no one more than the sagacious and far-sighted student whose untimely end they are united in mourning.

Time was when progress was mainly material, and when he who made two blades of grass to grow where one grew before was a great human benefactor; now horizons have widened, and progress has changed its course so far that he who sows ideas and harvests knowledge is coming to be reckoned among the greatest of benefactors. Of such was Dawson's work; gaining broader knowledge of his country than any predecessor, he gathered the wide-spreading strands in single grasp; writing treatises on geologic history among the most masterly ever penned, he was able to look from the past through the present and into the future far more clearly than most of his fellows; so his surveys of natural resources and possible utilizations contributed in unexcelled degree to the welfare of his nation and others, while the light of his knowledge and the radiance of his example have raised in due measure the intellectual plane of the western world.

Dawson was one of the men who left the world better because he lived in it.

W J M.

BOOK REVIEWS

Symbolism of the Huichol Indians. By CARL LUMHOLTZ. (Memoirs of the American Museum of Natural History, Volume III. Anthropology II.) New York: May, 1900. 4°, 228 pp.

This latest work of the distinguished explorer and ethnologist, Dr Carl Lumholtz, is one of the splendid series of *Memoirs* in course of publication by the American Museum of Natural History, New York, and embodies a portion of the results of extended studies, beginning in 1895, among the Huichol Indians, an agricultural Nahuatlan tribe, numbering now about 4000 souls, residing in the heart of the Sierra Madre, in the state of Jalisco, southern Mexico. If "mountaineers are always free," so also are they conservative, and to the forbidding and inaccessible nature of their country is due the fortunate fact that, while so many other native civilizations have long since been wiped out by the conqueror, the Huichol have been able to preserve their system intact until it could be studied and presented to the world by so competent an authority as Dr Lumholtz.

Notwithstanding its attractiveness, the subject of symbolism is always a dangerous one to handle, by reason of the constant temptation to theorize on hidden meanings and to interpret simple facts from the occult standpoint. Of such speculation run wild, Adair's celebrated work on the southern tribes is a conspicuous example. It is pleasant to find that the Doctor's scientific training and experience have enabled him to avoid this error, and from his remarks on page 211 concerning "a strong tendency to see analogies," it is evident that he has learned, what some investigators fail to remember, that mysticism feeds upon itself, and that much that is set down as symbolism has its origin in the mental vagary of the individual informant and is no part of any recognized system.

After an introductory sketch of the Huichol tribe and territory the author treats successively of Gods and Their Paraphernalia, Ceremonial Arrows, Front Shields, Back Shields, "Eyes," Votive Bowls, The Ark of the Deluge Legend, The Shaman's Plumes, etc., Facial Paintings, and Miscellaneous Symbolic Objects, followed by a summary of conclusions, indexes to the prayers, symbols, objects, and ideas.

The gods have fixed relationships; thus we have Father Sun, Grandfather Fire, and Great-grandfather Deertail. Their images are kept, not in the temples consecrated to them, but in remote secret places, usually caves in the mountains. In their symbolic presentation the gods are seen most commonly as serpents, frequently also as eagles or hawks, or as the sacred *hikuli* (peyote) plant. These symbolic forms are in large measure interchangeable and thus practically narrowed down to the one great symbol of the serpent, whose image the Huichol sees in every phenomenon of nature—the rain, the fire, the clouds, the wind, the ripples on the water, and the waving tree-tops.

The temples, of which there are nineteen in the Huichol country, are large circular houses of stone, with doorways facing to the east, and thatched roofs which are removed every five years, five being the sacred number in the tribe. Although no sacred images are kept in these temples, to which the people constantly resort for prayer and sacrifice, yet the gods are always present invisibly, and stools and chairs are kept there for their convenience, each seat being decorated in accordance with the taste and office of the deity for whose use it is designed. Diminutive votive offerings are also attached to them by the suppliants as reminders of the particular blessings desired.

Ceremonial arrows, in a great variety of forms, are inseparably connected with the religious life of the Huichol, one or more being sacrificed for each individual at least once a year. "The arrow, as an expression of prayer, answers to all the wants of the Indian from the cradle to the grave. There is no symbolic object in more common use, either by the private individual and the family or by the community, as represented by the officers of the temple. No feast can be imagined without the presence of arrows. Whenever an Indian wants to pray, his first impulse is to make an arrow. The sacrifice of one or more arrows expresses his desires in a language intelligible to him and to the gods." These sacrifice arrows are placed upright in the ground, stuck into the seats of the sacred chairs in the temples or into the thatch of the roofs; are deposited in sacred caves, at sacred springs, and other places; in lonely spots in the mountains, or even thrown into the sea—"in short, everywhere where some god lives whom the imaginative Huichol may implore and appease, for the arrow stands for him personally, or for the tribe, praying its silent prayers." In all this we see a close parallel to the prayer-feather of the Hopi.

The front and back shields are respectively symbolic types of the ancient war shield or buckler, and of the woven mat carried on the warrior's back, to serve both as a body armor and a bed. The front shields are generally round, while the back shields are rectangular, both being elaborately designed and decorated according to the various purposes for which they are intended. As an illustration it is noted that in order to prevent the rain going from their country to that of a neighboring tribe, the Huichol placed in the middle of the trails leading out of their territory a number of back shields upon which fierce animals were pictured, the idea being that the (living) rain would thus be frightened and compelled to turn back. To counteract the spell their neighbors made it a business to destroy these shields wherever they found them. Detailed description is given of the make-up and use of a large number of shields of both kinds.

The "eye" (*síkulí*) may briefly be described as a small mat set diagonally in the center of a small cross upon which it is woven, the details varying according to the god and the purpose. In a special manner it symbolizes the understanding of unknown things. Such "eyes" are sacrificed in large numbers to insure the health of young children. Votive bowls are ordinary drinking gourds specially ornamented with symbolic beaded designs to serve as sacrifices to the gods. They are smeared with blood and deposited in the temples.

The Huichol have a deluge myth in which one man is preserved in a peculiar box or ark, together with a black she-dog, who afterward becomes a woman, by which means the world is repeopled. Representations of this ark are sometimes made and deposited in certain places as sacrifices to obtain help in great emergencies. Such an ark was once fished out from a lake far to the south of the Huichol country, having been left there by some of the tribe "as one of the extreme means of getting rain," in accord with an Indian idea that what has once been connected with an effect has the power of reproducing that effect; hence, that the ark could bring rain.

Plumed wands are in constant use in ceremonies and conjurations. Sacred cakes of meal, in various fanciful shapes, are also sacrificed to the gods, and are sometimes tied in festoons about the temple until after the conclusion of the ceremony, when they are eaten by the priests or distributed to the people. Of curious interest are the talismanic rock crystals, which are regarded as "astral bodies" of dead or even living persons. Says Lumholtz: "In the collection I have a father and a mother, a grandfather and a grandmother, of the Indian who sold them to me." The stones are carefully laid away and fed at intervals with the blood of game, like the Ulûñsûti of the Cherokee.

Much symbolism attaches also to certain drums, sandals, scepters, bannerets, sea-shells, and flowers, and to certain stuffed animal skins, notably that of the gray squirrel, which in the primeval time was the protector of the Child Sun. Around the neck of the sacred squirrel-skin are sometimes tied the cocoons of a species of moth found in the eastern country. "These cocoons, which are those of a night animal, —their beds, in which they sleep before coming to life again,—are supposed to be the dreams of the gray squirrel, by which he is guided."

Considerable space is devoted to facial paintings and miscellaneous symbolic objects, while the concluding chapter is a valuable summary of the whole subject, as deduced from the objects and the explanations given by the Indians themselves. Of special value are the appendices, index of prayers, index of symbols, and index of objects and ideas. Throughout the volume are numerous references to the great *hikuli* or peyote cult, which dominates the religious thought of all the tribes of the plains and central plateau from the Arkansas river to the City of Mexico.

The author calls attention to close analogies with beliefs and customs in other tribes, particularly in Mexico and among the more northern Pueblos, and says: "Such phenomena should not cause surprise, as researches tend more and more to convince us of the similarity of Indian thought, under similar conditions." He might have gone farther and predicted that the final result will show a regular and unbroken connection in native cult and culture from the arctic regions to the tropics, of which the ancient systems of Mexico and Yucatan are but the highest development.

From cover to cover the volume is filled with curious information, brought together with painstaking and discriminating care, upon an intricate subject concerning which little that is authentic has hitherto been published.

On page 110 the Doctor says: "To the Indian the Sun, of course, is a man." He probably means a *person*, as with many tribes the Sun is a woman, as it was with the ancient Germans (*die Sonne*).

The illustrations from drawings by Mr Rudolf Weber, with the maps and splendid colored plates, are in keeping with the general excellence of all the publications sent out from the American Museum.

James Mooney.

The Political Economy of Humanism. By Henry Wood. Boston: Lee & Shepard, 1901. 12°, 319 pp.

This book is not a formal treatise in which the principles of political economy are systematically presented, but may be regarded rather as a series of essays on economic questions of current interest, the discussion of principles being subsidiary to the presentation of the author's views on these questions. Among the subjects treated are Combinations of capital, Combinations of labor, Governmental arbitration, Economic legislation and its proper limits, Socialism as a political system, Wealth and its unequal distribution, The law of centralization, "Booms" and panics, Money and coinage, Tariffs and protection, The modern corporation, The abuse of corporate management, The evolution of the railroad, Gold production and values, and Social experiments in Australasia.

The author's general attitude is that of opposition to governmental interference in industrial affairs. In his chapter on Economic legislation and its proper limits, he says:

"As fundamental principles we may conclude first, that the State should not interfere in any enterprise that may be as efficiently carried on by private control; second, that it should leave all questions of prices, rates, wages, and hours, to the natural regulation of free and untrammeled conditions."

He admits, however, that as the supply of water and light in a municipality involves the use of the public streets, it must at least be subject to public regulation, and apparently regards municipal ownership of waterworks and lighting plants as possibly advisable in some cases. A protective tariff is in conflict with the principle he favors, but however objectionable it may be from a cosmopolitan, it is, he thinks, expedient from a national point of view. In his opinion the question of higher or lower duties on imported commodities is in most cases a matter of much less importance than their respective advocates imagine; while, on the other hand, the changes and uncertainties due to the position of the tariff as a party issue are a cause of serious harm. An ideal tariff, he thinks, is not to be expected as the result of legislation enacted amidst the influences brought to bear upon legislators by a multitude of local interests; but "a commission of economic experts . . . formed with a single aim for justice and the public welfare, occupying an American standpoint, and uninfluenced by political ties and questions of party advantage . . . would be able to outline a very perfect revenue system."

The prevalent disposition to regard great organizations like the Western Union Telegraph Company as dangerous monopolies is set down by this writer as a prejudice in which "there may be more danger . . . than in the organizations themselves." There is, he says, "what may be called a normal rate" for telegraphic service, "and in case the management make a tariff above this point, demand falls off and profits shrink with as much certainty as they would in case it were put below it." This would be very reassuring if satisfactory evidence were supplied that this so-called "normal rate" will be one that is fair to the public. No such evidence is, however, presented. That there *is* a rate at which the profits of the company will be larger than they would at any other, whether lower or higher, may be freely granted, and the company's managers may probably be trusted to learn by experience what that rate is and not to fix their charges at any higher and less profitable level. But the point of real importance is whether this rate of maximum profit is also a fair one, and upon this point no light whatever is thrown by the mere act of calling the rate in question a "normal" one, however appropriate that name may appear from the point of view of the shareholders and managers of the corporation.

Of the results of social experiments in Australasia the author takes a more pessimistic view than the facts seem to warrant. For example, on page 307 he speaks of the "merely nominal increase, or in many cases the positive decrease, in the population of a vast undeveloped domain like Australasia, which should naturally be in the enjoyment of youthful and vigorous growth." In point of fact, the increase in population for the seven colonies during the nine years 1891–99 amounted to 697,850, or 18.4 per cent, a rate which exceeds 20 per cent per decade. While this rate is not so high as that of several earlier periods, it can hardly be considered low, in view of the great distance of these colonies from the countries on which they depend for their immigrants, especially when it is remembered that a period of industrial depression following a financial crisis, and aggravated by two or three successive seasons of severe drought, had given a check to immigration—a check which it would, however, be premature to regard as more than temporary. The "merely nominal" increase which, in the same paragraph, he declares is occurring in the population of New Zealand amounted during the nine years ending with 1899 to about 21 per cent. This rate of increase is more than twice as great as that of Germany for a like number of years in the last decade for which statistics are at hand; and among European countries Germany holds a high rank in respect to the rapid increase of her population. The large number of emigrants from Victoria—"mostly able-bodied men"—to which he calls attention in the same connection appears at first glance somewhat startling; but when it is remembered that Victoria is a mining colony, and when it is found on further investigation that the extraordinary movement of population referred to consisted mainly in a large migration—"mostly of able-bodied men"—from the Victorian mining districts to the newly discovered and productive gold-fields of Western Australia, it immediately becomes apparent that this movement is not of a character to threaten the depopulation of Australasia.

In respect to the literary style of the book under review, it may be said that a lack of precision in the use of words is often noticeable. For example, on page 302 the author speaks of "calm and accurate information," where he apparently means accurate information calmly considered. In another place he introduces a table as a "table estimated from reports of the Mint Bureau," the fact apparently being that the table in question was either copied or compiled from those reports. The inexact use of English illustrated in these instances and in many others that might be pointed out is scarcely indicative of the clear and careful thinking necessary to the proper treatment of such subjects as the author undertakes to discuss; yet his book is undeniably interesting and intelligently critical readers may find it sufficiently suggestive to repay perusal. EDWARD T. PETERS.

Vergleichende Studien zur Stellung der Frau im Alterthum. Erster Band. *Die Frau im Talmud.* NAUM KLUGMANN. Vienna: 1898.

The sources upon which the study of the position of woman in Jewish antiquity is based are the Bible and the Rabbinical literature (Talmud and Midrash), inasmuch as they contain either special ordinances and regulations relating to the status of woman, or incidental estimates of woman's nature and character.

To begin with the beginning, the birth of a daughter was in general not hailed with the same joy as that of a son; still the baby girl was nevertheless welcomed into the family and cherished with the same tender care as the boy. There was even a preference for the female as first child. Infanticide and exposing were unheard of in Judaism. A father in great straits, after he had disposed of his real and personal property, could sell his daughter, before she attained puberty, *i. e.*, the twelfth year of age, into servitude, but then only under condition that either her master or his son should subsequently marry her — a condition which, by the way, throws a significant light on the thoroughly democratic spirit which prevailed in Israel. Otherwise she became free on attaining maturity, nor could she be given another master by her father.

In the education of the daughter the training in housework occupied the most important part. Intellectual pursuits were not encouraged,— were even frowned upon by some of the Rabbis. "Woman's wisdom is limited to the spindle," is one of the ungallant Rabbinical sayings. Still they were not absolutely discouraged or shut out from woman's reach. Alongside with the saying quoted above are met in the Talmud such sayings as: "It is the duty of every one to instruct his daughter," and "The study of Greek wisdom is an ornament to women." And as a matter of fact not only did women grace public festivals with singing, playing of instruments, and dancing, but the Bible knows of prophetesses and poetesses, and in the Talmud several women are introduced for their learning and high intellectual attainments.

Passing over to the condition of woman in married life, there is to be pointed out the unique position of the Jewish daughter in that her father could not dispose of her hand and heart according to his pleasure, but that her consent was necessary in marriage. On the other hand it is well known that the Jewish lawgivers sanctioned, or at least accepted as *de facto* institutions, both polygamy and divorce. And while it may be assumed that the former came more and more into desuetude in Talmudic times, the general trend of the Rabbinical legislature was to facilitate the latter, and we can not join the author in his enthusiasm over it. There might be quoted touching warnings by the Rabbis against divorce; whether they palliated the effect of the liberal laws in practice is withdrawn from our knowledge. As wife the Jewish woman was the subordinate but honored and cherished helpmate of the husband. Honoring of one's wife is enjoined by the Talmud as the condition of securing the blessing of God. "One should eat and drink under his income, dress according to his income, but honor his wife above his income." And while she was to work and manage the house, she was not to be a drudge. One Rabbi forbids heavy work to woman, as it may impair her sexual functions.

The widow, and for that matter also the divorced woman, was perfectly *sui juris* and could marry again. The former, so long as she remained in the widowed state, was to be supported from the estate left by the deceased husband. It might be added that to judge from many expressions in Bible and Talmud, such as for instance, "God is the judge of widows," a widow was an object of special care and consideration in the Jewish community.

It can be said, after considering all the utterances relating to woman in Jewish literature, that the position of woman among the ancient Jews was a comparatively high and dignified one. She had no "equal rights" with man, her sphere of life and activity was limited — to the home; but within this sphere she moved freely and was the mistress, not the slave. The proprietary rights over the female members of the family accorded to man among the ancient peoples, as also the institutions of the Asiatic harem and the Greek *gyneconitis*, were unknown among the Jews. The intercourse between both sexes was comparatively free. In the incidental and proverbial sayings about woman there are as many and as keen satirical shafts directed against her as in the literature of any other people. But the Jew, it seems, was not only by temperament averse to harshness against his daughters and wives, but was also deeply imbued with the worth and mission of woman as wife and mother; as one Rabbi says: "Thy wife is thy family."

I. M. CASANOWICZ.

Tanz Objecte vom Bismarck Archipel., Nissan und Buka. W. FOY. (Pub. aus dem Königl. Ethnog. Museum, Band XIII.) Dresden: Stengel & Co., 1900. Folio, 40 pp., 17 pl., 2 figs.

Of the thirteen volumes in the folio series published by the Royal Ethnographic Museum in Dresden, under the direction of Dr A. B. Meyer, ten are devoted to southeastern Asia and the archipelagos adjoining. Since our own country, having made an experiment with the African, has adopted a goodly number of dwarfed Papuans, this last-mentioned race will now engage our thoughts, ethnical and political, and Dr Meyer will be our best guide. In the volume here reviewed, the plan of all the others in the series is followed out carefully, namely, of presenting the object, not in lithograph or drawing, but by photographic processes. By this means the museum in Dresden multiplies itself many hundredfold and makes possible a coöperative, institutional research and judgment. The student of Dr Foy's volume will also find that his desire to be in touch with a wide range of authors has been fully anticipated in text and footnotes. Most elaborate tables of contents, indexes, and catalogue numbers for the Dresden Museum leave nothing to be desired.

In 1889 Dr Meyer published Volume VII of the series on *Masks of New Guinea and Bismarck Archipelago*, and in 1895 appeared Volume X, on *Carvings and Masks from Bismarck Archipelago and New Guinea*, by Meyer and Parkinson. In the introduction to Volume XIII will be found an excellent account of studies in masks as ceremonial paraphernalia the world over. The student is cautioned also against too hasty generalizations concerning acculturation through analogies and superficial resemblances. The ingenious and elaborate carving and the weird mixture of color in the masks of the Papuans and their kindred have always had a fascinating interest for the ethnologist. In plate xiii will be found sixty-five motives on mask ornamentation from New

Mecklenburg (New Ireland), all drawn from well-known fishes. The excursus, pages 31–35, devoted to this plate, throws a flood of light on the otherwise hopeless confusion of parts and drawings. The composite Yukon masks, in which all nature is shown to be quickened by the return of the sun, offer a slight parallel, though the Eskimo artist is handicapped by lack of good materials. Farther south the giant cedar holds out its friendly trunk to the wood-carver, and both on it and in it he fixes his spirit life, the art motives as analyzed by Boas being his commonplace activities and associations. So, by means of the descriptions in the text and the elucidation of plate xiii the student of mythology finds out that the Papuan clothes himself in a material symbolism that prays louder than words in the ears of his gods for supplies to his common wants. It may be that the divine benefactors do not understand the jargon of the petitioner, but their eyes can never be deceived when they rest on his elaborate requests in form and color.

O. T. MASON.

Volkstum und Weltmacht in der Geschichte. Von ALBRECHT WIRTH, München : Bruckmann, 1901. 8°, 236 pp.

Volkstum und Weltmacht, "peopledom and worldmight," or, in plain English, the development of nationality and world-powers in history. The author brings together in this volume a number of special studies on the gradual widening of culture as shown in the development of nations and enlarged conquest. Race and forms of civilization have been most active forces in this evolution, working through inner vitality and normal growth, through the union and combination of adjoining cultures and by finally breaking out of bounds and expansion. The study is divided into the following periods, marking also, as it were, epochs of widening :

1. Mesopotamian-Egyptian period	to 1300 B.C.
2. Classic period	1300 B.C. to 224 A.D.
3. The Double period, Northern and Southern races unfolding	224 A.D. to 1250 A.D.
4. The Oceanic period	1250 A.D. to 1900 A.D.

The larger part of the volume, necessarily, is devoted to the fourth period—the awakening of nations, races, and religions, and to the present as the outcome. The debate on race and culture is continued, and the volume closes with a series of chapters on peoples in relation to the absorption or disappearance of smaller peoples, to territory, to the state, clan feeling, industry, and power. We are called "Jankees" on page 20, and shall have to get used to it. Again, the national conceit is a little hurt by the fact that the term "United States" does not occur in a book of 236 pages devoted to expansion! O. T. MASON.

Om Kalevala, Finnarnes nationalepos och forskningarna rörande de detsamma. Af K. B. WIKLUND. Stockholm: Norstedt & Sons, 1901. 12°, 39 pp.

This little volume contains a Swedish essay on the Finnish national epic poem, *Kalevala*, and forms number 71 of the publications of the Heimdal Society, the purpose of which is to put in circulation works of popular interest—topics of Swedish and Scandinavian national history and folklore. The Heimdal Society, now in its eighteenth year, is named after one of the principal Norse deities and is composed of a body of students at the University of Upsala. *Kalevala* is not a Scandinavian but a Finnish topic; nevertheless the spirit pervading the poem is such as to interest all inhabitants of the three Norse countries, and the specimen "Trettiosjette runan" gives an idea of Wiklund's own poetic attainments. The contents of the seventy other Heimdal publications, according to the published list, refer to historical characters, as Erik Dahlberg, Gustav II, Gustav Vasa, Gustav Adolf, Alexander the Great, and Luther; and to travels in Sweden, the Dutch in South Africa, and other contemporary matters. A. S. GATSCHET.

Album of Papúa-Types. II. North New Guinea, Bismarck Archipelago, German Salomon Islands. By Dr A. B. MEYER and R. PARKINSON. Dresden: Stengel & Co., 1900. 4°, 4 ll., 15 pp., 53 pl.

This splendid album is supplementary to one (now out of print) prepared by the same authors and published under a similar title in 1894. The excellent photographs were made by Mr Parkinson, while the brief but adequate descriptive text in German and English is from the able pen of Dr Meyer. The 53 heliotype plates, showing some 550 figures, portray various types of the still remarkably primitive indigenes of the regions indicated in the title, together with their dwellings, ghost-houses, mask houses, canoes, etc. As is the case with every publication for which Dr Meyer has been responsible, the mechanical aspect of the album leaves nothing to be desired. F. W. HODGE.

PERIODICAL LITERATURE

CONDUCTED BY DR ALEXANDER F. CHAMBERLAIN

GENERAL

von Andrian (F.) Die Siebenzahl im Geistesleben der Völker. (Corrbl. d. deutschen Ges. f. Anthrop., 1900, XXXI, 96–98.) Brief general discussion of "the evil seven," the mystic and cosmic seven, etc., among the peoples of Asia and Europe, with the conclusion that the "seven-cult" has spread from Mesopotamia over Europe, Asia, parts of Africa and Polynesia. No explanation is offered for its occurrence in certain regions of America.

Bartels (M.) Was können die Toten? (Ztschr. d. Ver. f. Volkskunde, Berlin, 1900, X, 117–142.) A critical enumeration, with references to the literature of the subject, of the acts attributed to the dead by the popular mind. Opening the eyes, singing, eating, disease-removing, returning to earth, night-journeying, speaking in prose and in verse, "death-kissing," advice-giving, omniscience.

Bastian (A.) Zum Seelenbegriff in der Ethnologie. (Ethnol. Notizbl., Berlin, 1901, II, 77–97.) A characteristic discussion of primitive conceptions of the soul from the *doyen* of German ethnologists.

Beeton (*Miss* M.), **Yule** (G. V.), and **Pearson** (K.) On the correlation between duration of life and number of offspring. (Proc. Roy. Soc., London, 1900, LXVII, 159–179.) Gives results, with many tables and curves, of study of English and American Quaker mothers and fathers and of fathers in Burke's "Landed Gentry." In both America and England "the influence of longevity on the fertility of the father is greater than its influence on the mother." Another fact brought out is that "American men and women are more alike, and English men and women more alike, than the women to the women, or the men to the men of the two races."

Boas (F.) The mind of primitive man. (Science, N. Y., 1901, N. S. XIII, 281–289.) Address of President of American Folk-Lore Society. Treats of differences between mind of primitive and of civilized man. Author considers it probable that "the wide differences between the manifestations of the human mind in various stages of culture may be due almost entirely to the form of individual experience, which is determined by the geographical and social environment of the individual." A very suggestive address.

Bolton (H. C.) Physics and faith. (Ibid., 241–246.) Address of President of Chemical Society, Washington. Discusses among other things the faith of men of genius in intellectual conceptions.

Brandes (G.) Ueber eine Ursache des Aussterbens einiger diluvialer Säugetiere. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 103–107.) The author takes the view that not the action of man, sparsely distributed over a vast area, but the form of the animal's tusks (disadvantageous to the individual) was a chief cause of the dying out of the mammoth.

Carus (P.) Anubis, Seth, and Christ. (Open Court, Chicago, 1901, XV, 65–97.) This numerously illustrated paper discusses some aspects of the assimilation by early Christianity of pre-Christian ideas.

Chervin (*Dr*) Traditions populaires relatives à la Parole. (Rev. d. Trad. Pop., Paris, 1900, XV, 241–263.) Folklore relating to "tongue-cutting," crying, stammering, mutism, etc.

Culin (S.) The origin of ornament. (Bull. Free Mus. Sci. and Art, Phila., 1900, II, 235–242.) A general argu-

Culin — *Continued.*
ment in favor of the thesis that ornament and adornment "are the products of religious sentiment, of magic and superstition," and are not primarily based upon innate love of the esthetic or sexual attraction.

Cutore (G.) e **Fichera** (G.) Varietà anatomiche riscontrate durante l'anno scolastico 1899–1900. (Arch. p. l'Antrop. e la Etnol., Firenze, 1900, XXX, 55–85.) A good description (with bibliography of 69 titles) of the anatomical variations,—osseous, muscular, arterial, nerves and urinary organs,—observed in the dissecting room of the Anatomical Institute of the University of Catania.

Drechsler (P.) Das Rückwärtszaubern im Volksglauben. (Mitteil. d. Schles. Ges. f. Volkskunde, Breslau, 1900, 45–50.) Examples of belief in the power of "backwards doing" in folk-thought.

Eisler (P.) Ueber die Herkunft und Entstehungsursache des Musculus sternalis. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 150–154.) In this article, with three figures in the text, Dr Eisler argues that the *Musculus sternalis* is an aberration of independent origin (neither prospective nor retrospective) due to the conditions of the sternal region.

Ferraro (G.) La genesi della mitologia meteorica. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 469–481.) The personification of atmospheric phenomena is thought by the author to have a "corporeo-psychic" origin, as seen in primitive peoples and children. Evidence in proof of this. Ferraro considers that the age of two to five in children corresponds to the creation-period of such mythology.

Giuffrida-Ruggeri (*Dr* V.) Ricerche morfologiche e craniometriche nella norma laterale e nella norma facciale. (Atti. d. Soc. Rom. di Antrop., 1900, VII, fasc. 2.) Discusses height of squama of temporal bone as race-characteristic (results not very satisfactory), fontanelle bones and suture spaces and the *norma lateralis*, pretemporal bone, nasal skeleton, bipartite zygomatic bone, etc.

—— Sopravvivenze morfologiche in crani di aleniati. (Arch. d. Psich., Sci. Pen., ed Antrop. crim., Torino, 1901, XXII, fasc. 1.) Describes the mandible of an idiot, whose excessive volume causes it to approach that of prehistoric man; also notes the occurrence of the *torus occipitale* in the skull of a lunatic.

Gusinde (K.) Ueber Totenbretter. (Mitteil. d. Schles. Ges. f. Volkskunde, Breslau, 1900, 27–40.) An interesting account of "death-boards" in Central Europe (many inscriptions are cited), with numerous references to the literature of the subject. The superstitions are also noted.

Hartland (E. S.) Totemism and some recent discoveries. (Folk-Lore, London, 1900, XI, 52–80.) Address of President of Folk-Lore Society. Discusses the recent researches and publications of Dr Franz Boas in America and Messrs Spencer and Gillen in Australia, which, the author believes, have dealt "smashing blows" at the Maclennan-Frazer-Smith-Jevons theory of totemism, so that "there is hardly one stone of the fabric left upon another."

Henderson (C. R.) Prison laboratories. (Amer. Journ. Sociol., Chicago, 1900, VI, 316–323.) General statement of case for the institution of anthropometric and psycho-physical laboratories in prisons, with report of a committee of the National Prison Association.

—— The scope of social technology. (Ibid., 465–486.) Social technology deals with the problem of means in sociology. General outline and discussion.

Keller (A. G.) Sociology and the epic. (Ibid., 267–271.) A general statement of "the value of these poetical documents of the past as affording well-nigh indispensable material for the student of the history of civilization." Appeals for monographs on the social data of the great epics.

Klaatsch (H.) Der kurze Kopf des Musculus biceps femoris und seine morphologische Bedeutung. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 145–150.) The author looks upon the form of this muscle as primitive, a rudimentary formation belonging to the ancestor of the mammals, now occurring only sporadically.

Lasch (R.) Weitere Beiträge zur Geophagie. (Mitth. d. Anthrop. Ges. in Wien, 1900, Sitzgber., 181–183.) Addenda to the article published in 1898.

Lasch — *Continued.* Treats of earth as food, geophagy of pregnant women, earth-eating as a religious rite, pathological geophagy. It is worth noting that while the ancient Mexicans forbade the eating of earth by pregnant women, in Java and other parts of the East Indies it is in high favor.

Lee (*Miss* A.), and **Pearson** (K.) A first study of the correlation of the human skull. (Proc. Roy. Soc., London, 1901, LXVII, 333-337.) Abstract of the results of the examination of the skull capacity of some 60 men and 30 women, whose relative intellectual ability can be more or less roughly appreciated. The conclusion arrived at is that there is no marked degree of correlation between skull capacity and intellectual ability.

Lefébure (E.) Mirages visuels et auditifs. (Mélusine, Paris, 1900, X, 25-39, 49-56.) A detailed account, with many bibliographical references, of ancient and modern folk-belief about mirages (water and land), phantasmagoria, strange noises, echoes, singing sands, etc.

—— L'Arc-en-ciel. (Ibid., 97-111, 121-125.) A very interesting study, well provided with citations, of the rainbow among the poets (classical and French in particular). The form, color, composition are considered.

Le Sueur (W. D.) Notes on the study of language. (Trans. Ottawa Lit. and Scientif. Soc., 1899-1900, 93-118.) Treats of some of the most important facts about the origin, growth, and acquisition of language, its nature and possibilities for the expression of thought.

Leuba (J. H.) Introduction to a psychological study of religion. (Monist, Chicago, 1901, XI, 194-225.) Largely concerned with the discussion of definitions of religion.

Lombroso (Gina). I vantaggi della degenerazione. (Riv. di Sci. biol., Torino, 1900, II, 848-874.) Treats of degeneration in evolution, physical resistance of degenerate man, useful pathological phenomena, weakness of apparent strength, longevity of degenerate individuals and races, influence of civilization on longevity and degeneration, etc. A suggestive exposition of the thesis that "not all the anomalies stigmatized as degenerate are as disadvantageous to the species and to the individual as is commonly thought."

Marett (R. R.) Pre-animistic religion. (Folk-Lore, London, 1900, XI, 162-182.) Aims to set forth certain very primitive phases of religion, the religious phenomena "before *animism*." The author thinks *awe* the best term wherewith to denote "the fundamental religious feeling." Awe finds vent in *animatism*, then animism. Pages 318-321 contain remarks on M. Marett's paper by Andrew Lang and reply by the author.

Marro (A.) Puberal hygiene in relation to pedagogy and sociology. (Amer. Journ. Sociol., Chicago, 1900, VI, 224-237.) General discussion of the proper treatment of the boy and girl during the development of puberty. Advises repression of excitement, extravagances, etc.; counsels the use of "cool applications."

Murray (G.) National ideals, conscious and unconscious. (Internat. Journ. Ethics, Phila., 1900-1901, XI, 1-22.) Argues that "the unconscious or concealed ideals are the real forces that govern mankind."

von Negelein (J.) Die Reise der Seele ins Jenseits. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 16-28.) First part (the departure of the soul) of a general discussion of beliefs and practices of all peoples concerned with the journey of the soul in the other world. The author endeavors to be entirely unprejudiced in his treatment of the subject.

Netolitzky (F.) Ueber die Anwendung des Mikroskopes in der Urgeschichtsforschung. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1901, XXXI, 1-2.) Points out the importance of microscopical examination of the remains of textile materials, plants (used for food and other purposes), the earth in graves, mounds, etc., the exuviæ of animals and of human beings, the remains attaching to pottery and fragments of kitchen-utensils, weapons, and the like for ascertaining facts relative to the food-habits, plant-use, etc., of primitive man.

Penka (K.) Die Ethnologisch-ethnographische Bedeutung der megalithischen Grabbauten. (Mitth. d. Anthrop.

Penka — *Continued.* Ges. in Wien, 1900, XXX, N. F. XX, 27–43.) A general discussion of the distribution and racial significance of megalithic grave-monuments (dolmens, etc.). The author notes the growth of the opinion that these relics of past ages have a common origin although widespread over the Eurafrica-Indic region. The article is well provided with references to the literature of the subject, and the views of Montelius, Meitzen, and Sophus Müller are gone into in detail. Penka sees in the small stone-chambers imitations of the dwellings of the living. The dolmens of the Mediterranean region are to be attributed to the blonde, *i. e.*, the Aryan race.

Polívka (G.) Tom Tit Tot. Ein Beitrag zur vergleichenden Märchenkunde. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1900, X, 254–272, 325, 382–396, 438–439.) A detailed discussion of the origin and development, relationships, etc., of the tale after which Clodd's recent book is named. A valuable addition to the latter (which is more concerned with the content of the tale).

Read (C. H.) Presidential Address. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, 6–21.) A review of the contributions to anthropological science by the members of the Institute during 1899, with more details in the case of those lately deceased.

Regnault (Félix) Le costume, son origine et ses transformations. (Rev. Scientif., Paris, 1901, 4^e^ sér., XV, 103–112.) This article on the evolution of dress discusses briefly the rôles of utility, ornament, esthetics, trophy, relicism, modesty, etc., in the origin of dress. The influences of climate, active life, imitation, exaggeration, misoneism, age, social status, profession, urban and rural life, sex, are noted, and the conclusion contains some good advice on "the science of dress." The author expresses the safe opinion that "the origin of dress is complex."

Reinach (S.) Quelques observations sur le tabou. (Anthropologie, Paris, 1900, XI, 401–407.) A general discussion of the origin and meaning of taboo, and an attempt to define more exactly its signification. For the author a taboo is "une interdiction non motivée," unaccompanied by the threat of intervention of a legislator, and having the object of shielding men from unknown danger, and from the peril of death in particular. The roots of the taboo reach back into the animal world below man.

Russell (F.) Anthropology at Baltimore. (Science, N. Y., 1901, N. S. XIII, 139–142.) Brief account of papers read before Section H., A. A. A. S., at Baltimore, Md., Dec. 27–28, 1900.

de Saussure (L.) Le point de vue scientifique en sociologie. (Rev. Scientif., Paris, 1901, 4^e sér., XV, 34–44.) The "scientific point of view" is the spirit of research into the relations of phenomena which is not biased by any utilitarian or sentimental considerations. This essay is the introduction to a "science of the relations of civilization to barbarism," which is to be embodied in a series of works edited by the author.

Schmid-Monnard (*Dr*) Ueber den Werth von Körpermaassen zur Beurtheilung des Körperzustandes von Kindern. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 130–133.) Discusses, with two tables and three sets of curves, the value of bodily measurements as indications of bodily conditions in children. Notes the existence of numerous deviations from the norms without any trace of disease or sickness. As the result of the investigation of 1021 boys and 1071 girls (from birth up to 14 years of age) belonging to Halle, the author concludes that there exists between stature and weight a fixed relation independent of age; hence when such relation is noted small size is nothing pathological.

Sergi (G.) Le forme del cranio umano nello sviluppo fetale in relazione alle forme adulte. (Riv. di Sci. Biol., Torino, 1900, II, 831–847.) The greater part of this second part of Prof. Sergi's study of the developmental relations of the fetal to the adult forms of the human skull is devoted to a descriptive and systematic catalogue of 88 fetal skulls (chiefly at term), preserved in the Museum of Comparative Anatomy (Jardin des Plantes) and the Broca Anthropological Museum (School of Medicine) at Paris. The measurements of length and breadth, together with the cephalic index are given, and there are eight figures in the text. The conclusions of the previous paper, with one or two exceptions, are confirmed.

Super (C. F.) Civilization and the ethical standard. (Amer. Antiq., Chicago, 1900, XXII, 358–366.) An argument for the "inherently ethical" nature of man in spite of his lapses, mistakes, and flippant treatment at times of the true, the good, and the beautiful.

Stefané-Pol (M.) La réglementation scientifique du mariage. (Rev. Scientif., Paris, 1901, 4^{e} sér., XV, 34–44.) A reply to the arguments set forth in a previous number by M. Cazalis, whose book, La Science et le Mariage, has just been published. To encourage marriages, not to put obstacles in their way, is the better remedy; to prevent the marriage of the unfit may not accomplish as much as to secure the marriage of the fit, and improve the environments of all.

Thomas (N. W.) Animal superstitions and totemism. (Folk-Lore, London, 1900, XI, 227–267.) This valuable paper, provided with numerous bibliographical references, treats in considerable detail of the animal superstitions connected with totemism, which, the author says, "has been found as a living cult in only two considerable areas of the world's surface—North America and Australia." The superstitions in question are discussed under the following heads: Totemic or quasi-totemic; animals used in augury and sacrifice; annual ceremonies (sacrifice, communion). The author believes that the facts he has collected "conclusively prove the existence of an animal cult in Europe," and that the great mass of animal superstitions "originated in a system of totemism differing in no essential respect from that which we find among the non-European races."

EUROPE

d'Araujo (J.) Proverbios venezianos com equivalencia portugueza. (A Tradição, Serpa, 1901, III, 12–15.) A list of 92 Venetian proverbs and their equivalents in Portuguese.

d'Azevedo (P. A.) As Boas-Festas. (Ibid., 42–44, 75–76, 91–93.) An historical account of the Christmas and Easter festivals, which alone enjoy the epithet "good festivals."

Bacher (J.) Von dem deutschen Grenzposten Lusern im wälschen Südtirol. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1900, X, 151–162, 306–319, 407–417; 1901, XI, 28–37.) Three sections of an interesting study of Luserna, a mountain community of German stock in the Italian Tirol. A brief historical sketch takes up the first part, the three others consisting of tales in the Luserna dialect, the original phonetic text and German translation being given in parallel columns, with explanatory notes on difficult or unusual words. So far 20 tales are recorded in these pages.

Balfour (H.) Guilloche pattern on an Etruscan potsherd. (Man, London, 1901, 8.) The potsherd here figured and described illustrates a genesis of the guilloche by "a more or less unconscious process, beginning with concentric circles in series."

Balladoro (A.) Cinquanta indovinelli Veronesi. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 34–39.) Of these 50 Veronese riddles 10 are in prose, 8 in three-line and 32 in four-line verses.

—— Impronte maravigliose in Italia. (Ibid., 126–129, 186–189, 443–449.) Continuation (Nos. XCIV–CXVII) from previous articles on "magic imprints." Imprints of hands, feet, etc., on pavements, rocks, marks of injuries on statues, persons changed into stone, etc., are discussed; several of the items relate to the Devil.

Bancalari (G.) Forschungen und Studien über das Haus. VI. Volksmässige Benennungen der Geräthe. (Mitth. d. Anthrop. Ges. in Wien, 1900, XXX, N. F. XX, 1–23.) This article discusses the popular names in Austria and Germany of lamps and lights, stoves and heating apparatus, kitchen apparatus and utensils, furniture, vessels for fluids and solids, baskets, barn, stable and kindred implements, agricultural implements, etc., and contains many valuable items of culture-history. The names for lighting and heating apparatus are particularly interesting. It is worth noting that the "fire-dog" (*Feuerhund* in Berchtesgaden) is known as "fire-horse" (*Feuerross*) in Steiermark and Upper and Lower Austria.

Barella (D.) Cantilene infantili della Sardegna centrale. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 307–321, 433–442.) Texts, with occasional notes, of 87 *cantilenæ*, of which

Barella — *Continued.* 15 relate to natural phenomena, 19 to animals, birds, insects, etc., 10 to playthings, 21 to raillery at bad actions, names, etc., 13 to games. These children's songs were collected in Nuoro and the surrounding villages, though a good many of them belong to the whole island.

Blümml (E. K.) und **Rott** (A. J.) Die Verwendung der Pflanzen durch die Kinder in Deutschböhmen und Niederösterreich. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 49–64.) In this interesting and valuable paper the authors enumerate (the common and botanical names are given), with occasionally detailed explanatory notes, 106 species of plants used for various purposes (food, games, childish arts and industries) by children in German Bohemia and Lower Austria.

Bogišić (V.) Publication et enquête de proverbes en Russie. (Mélusine, Paris, 1900, X, 129–141.) Discusses recent studies of Russian proverbs by Simoni. The author's collection of proverb-literature numbers 1,500 books and pamphlets and MSS. containing 90,000 proverbs (Slavonic 62,000).

Bolte (J.) Volkstümliche Zahlzeichen und Jahreszahlrätsel. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1900, X, 186–194.) Deals with signs used by the folk (builders, masons, threshers, etc.) for the numbers 5, 10, 11, 19, etc., and with "year-riddles," of which latter many examples are given; CLX, *e. g.* = a sausage, a scythe, and a cross. Some interesting comparisons might be made here between these folk-phenomena and the "number forms" of childhood.

Bosanquet (B.) The English people: notes on national characteristics. (Internat. Monthly, Burlington, Vt., 1901, III, 71–116.) A popular sketch of race-psychology well and interestingly written by a philosopher. Insularity, inarticulateness, particularity, individuality, etc., are discussed in their various bearings upon English thought and action.

Breuil (*L'Abbé*) L'âge du bronze dans le bassin de Paris. I. Les épées et dagues du bassin de la Somme. (Anthropologie, Paris, 1900, XI, 503–534.) The first part (with eight figures, illustrating 119 specimens, in the text) of thorough-going study of the age of bronze in the Paris basin. This article deals with swords and daggers, their parts and appurtenances, wholly or in part of bronze. Comparisons are made with similar objects in England and esewhere.

Bünker (J. R.) Eine heanzische Bauernhochzeit. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1900, X, 288–306, 365–382.) A valuable, detailed description of the wedding-feast (the greatest and most brilliant of all their festivals) among the *Heanzen*, a German people dwelling in the western parts of Eisenburg and Odenburg in western Hungary. No item of the event seems missed.

—— Eiserne Opferthiere. (Mitth. d. Anthrop. Ges. in Wien, 1900, Sitzgber., 185–186.) Brief description, with 6 figures in the text, of animal figures of iron offered up, as votive gifts, at churches on certain saints' days within the last 30 years. Such offerings were once very common at Kogel, Trebesing, etc.

Buss (E.) Die religiösen und weltlichen Festgebräuche im Kanton Glarus. (Schweiz. Archiv f. Volkskunde, Zürich, 1900, IV, 245–308.) An interesting, more or less detailed account of annual festivals, occasional celebrations, family ceremonials, etc. in Glarus, from saints' days to festivals of youth, the whole round of folk-life being covered.

Calliano (G.) Prähistorische und römische Funde in und um Baden. (Mitth. d. Anthrop. Ges. in Wien, 1900, Sitzgber., 111–116.) General historical and critical sketch of archeological discoveries in and around Baden. The author holds that the remains of sculptures and marble-work especially dispose of the theory that Baden was only a little military station in Roman times.

Carmi (Maria) Il dramma della Passione ad Oberammergau. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 378–400.) A detailed account, with criticisms of the Passion Play at Oberammergau in 1900.

Casal (E.) La festa dei fior. (Ibid., 238–255.) Describes, with historical notes and numerous bibliographical references, the "festival of flowers" at Caprile, and discusses its significance.

Chadwick (H. M.) The ancient Teutonic priesthood. (Folk-Lore, London, 1900, XI, 268–300.) A comparative study of the priesthood in ancient Germany and Scandinavia. The author holds that the priests of the ancient Germans had little in common with the *vates* of the Gauls, and that priestly duties were discharged by the temporal chief, while in the Scandinavian region the existence of a priestly class has not been clearly demonstrated. M. Chadwick argues for the origin of the German priesthood from a previously existing monarchy.

—— The oak and the thunder-god. (Jour. Anthrop. Inst., London, 1900, XXX, N. S. III, 22–44.) Treats of the thunder-god among the Scandinavians, continental Germans, Celts, ancient Prussians, Slavs, etc.; of the "tree-sanctuary" among these peoples, of the association between the thunder-god and the oak, and of the theories relating thereto. The author concludes that "the cult of the thunder-god was in early times common to most of the Indo-Germanic races or peoples of Europe,"—the distribution of the tree-sanctuary is less certainly made out. Mr Chadwick holds that "the thunder-god was *the* god of the primitive European community" and that he was supposed to inhabit the oak "because it had formerly been the dwelling-place of his worshipper." The oak acquired its sanctity from the fact that priests dwelt under it and not *vice versa*.

Chamberlain (Isabel C.) The devil's grandmother. (Journ. Am. Folk-Lore, Boston, 1900, XIII, 278–280.) Brief list of folk-sayings of Teutonic peoples concerning the "devil's dam."

Coelho (T.) O Senhor Sete. (A Tradição, Serpa, 1900, II, 39–42, 69–71, 86–88, 97–102, 118–120, 135–138, 154–157, 162–168, 185–186; 1901, III, 8–10, 17–22.) "Mr Seven" is an interesting and valuable collection of folk-lore (poetry, proverbs, superstitions, etc.) relating to the number seven.

Ellis (H.) A study of British genius. (Pop. Sci. Mo., N. Y., 1901, LVIII, 372–380, 540–547, 595–603.) An anthropological-psychological study of the character, parentage, racial and social characteristics, etc., of British genius. The bases of the study are 859 men and 43 women of high intellectual ability as recorded in the Dictionary of National Biography, selected from the 30,000 persons with whom the 63 volumes of this work deal. Mr Ellis notes the presence of two important factors, "a spontaneous rhythmical rise and fall in the production of genius," and "the stimulating influence of great historical events, calling out latent intellectual energy." He also suggests that we may have "a fresh outburst of intellectual ability at the beginning of the twentieth century." As compared with England, Wales and Ireland produce not enough and Scotland more than her share of men of genius. Norfolk, in England, is a noteworthy genius-centre. The proletariat have produced few men of genius in contrast with the "gentlemen,"—education seems not to have changed this. Geniuses tend to be the oldest or youngest sons of large families (father 30–34 years, mother 26–40 old). Mr Ellis emphasizes the fact that men of genius in the conditions of their birth parallel the other classes of mankind who are mentally abnormal.

Förtsch (*Dr*) Ueber die vor- und frühgeschichtlichen Verhältnisse der Provinz Sachsen. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 77–80.) The author traces briefly the anthropological history of Saxony from the stone age down to the fifteenth century of our era. Very few traces of paleolithic man have been discovered hitherto in this region; the high development of stone-age ceramics is noteworthy; and the transition from stone to bronze seems to have been rather gradual. The Hallstatt and La Tène cultures appear to have existed side by side for a long time. The Slavs, Dr Förtsch thinks, brought little if any culture into Saxony.

Forzano (G.) La vita nel villagio di S. Gorgio. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 518–520.) Brief account of folk-life in a village of the Province of Messina.

Freund (*Dr*) Ein Faltstuhl aus der älteren Bronzezeit. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 144–145.) Describes a "folding chair" of the older bronze period, found in 1869 at Bechelsdorf (Ratzeburg), and notes the fact of the frequency of such chairs over a wide area during this age.

Gaster (M.) Two thousand years of a charm against the child-stealing witch. (Folk-Lore, London, 1900, XI, 129–162.) Discusses the wanderings of "one of the longest and most complete [the text is given] in the whole range of Roumanian charms," in oral and in written literature. The charm is held to be of Oriental origin, Babylonian, perhaps, and has changed comparatively little during the centuries.

Giuffrida-Ruggeri (V.) Le origini Italiche. (Riv. di Sci. Biol., Torino, 1900, II, 926–932.) A critical review of recent anthropological literature concerning the earliest Italian peoples and their culture. The author does not favor the term "Ibero-Ligurian," not admitting the identity of the two races. He also disapproves the attempt to make funeral-rites absolute evidences of race-diversities.

Götze (A.) Die Eintheilung der neolithischen Periode in Mitteleuropa. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 133–137.) An attempt by means of the grouping of pottery specimens (illustrated in the text) to fix a division of the neolithic period in central Europe. The author recognizes two sub-periods, the first of which is represented by "Schur-" and "Zonenkeramik."

Gray (J.) and **Tocher** (J. F.) The physical characteristics of adults and school-children in East Aberdeenshire. (Jour. Anthrop. Inst., London, 1900, XXX, N. S. III, 104–124.) This paper, supplied with tables, maps of distribution, and cephalic charts, *résumés* the results of the investigation of shape of the nose and the hair and eyes of 14,561 children (boys 7717) and 3262 adults (women 551); also the measurements of stature, height sitting, maximum length and breadth of head of 402 adults of various classes and occupations. Among the facts brought out by these investigations are the existence of "a very much smaller percentage of the blond element than has been generally supposed"; an excess of brown hair over brown eyes; post-natal darkening of females; increase of brown hair among adults 15 to 16 % (Virchow's estimate for Germany is 15 %).

Hein (W.) Die Opfer-Bärmutter als Stachelkugel. (Ztschr. d. Ver. f. Volkskunde. Berlin, 1900, X, 420–426.) Describes (with three figures in text) the use of iron spike-balls as votive offerings of women suffering from womb troubles in parts of Austria, Switzerland, and Germany.

Heinemann (F.) Die Henker und Scharfrichter als Volks- und Viehärzte seit Ausgang des Mittelalters. (Schweiz. Archiv. f. Volkskunde, Zürich, 1900, IV, 1–16.) A discussion of the rôle of the hangman and executioner as physician and animal-doctor in post-medieval Germany and Switzerland. As late as the first quarter of the nineteenth century the popular assembly at Altdorf had to choose, for "Landesphysicus," between a regular physician and the executioner of Uri.

Henning (*Dr*) Bericht über die letzten Strassburger Ausgrabungen und über die neue archäologische Bewegung in Deutschland. (Corrbl. d. deutschen Ges. f. Anthrop., 1900, XXXI, 92–96.) Deals with the discoveries of remains of the Roman period (city walls especially) at Strassburg, the Argentorate of the oldest documents. Contains also an appeal for the archeological investigation and preservation of the oldest German remains.

Hertzberg (G.) Die Halloren in Halle a. S. (Ibid., 118–120.) Brief account of the *Hallori* (the name is first known in 1630), or salt-workers, whose history is bound up with that of the city of Halle from the most ancient times.

Höfer (P.) Ueber drei neue Hausurnen und über Hausurnentypen. (Ibid., 115–118.) The number of hut urns so far discovered in Germany is 25 (from Saxony 16, and from Anhalt 6). Dr Höfer describes three new specimens from Hoym and Wulferstedt.

Hoffmann-Krayer (E.) Das Berner "Matten-English." (Schweiz. Archiv f. Volkskunde, Zürich, 1900, IV, 39–44.) Specimens—text and vocabulary—of a student-jargon in Bern, with request for further information.

Hoernes (M.) Bronzen aus Wien und Umgebung im k. k. naturhistorischen Hofmuseum und die Bronzezeit Niederösterreichs im Allgemeinen. (Mitth. d. Anthrop. Ges. in Wien, 1900, XXX, N. F. XX, 65–78.) A description (with four plates and two figures in the text) of bronze specimens from Vienna and the

Hoernes — *Continued.* eastern half of Lower Austria in the Royal Museum of Natural History, followed by a brief general account of the bronze age in Lower Austria.

Janowski (A.) Rysunki z piasku pized chata. (Wisła, Warzawa, 1900, XIV, 314–318.) Describes briefly, with two plates (21 figures) sand-drawings made in front of the huts at Smardzewice.

Kahle (B.) Der Ort der Hochzeit auf Island zur Sagazeit. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 40–46.) From the data in the old Iceland sagas, the author argues that a solemn procession or conduction of the bride to her new home, where she was formally given over to her waiting husband, did not take place; the nature of the country accounts for the absence of this. The various places where weddings took place—house of either party, of parents, relatives, guardians, friends, etc.—are noted.

Köhl (*Dr*) Neue stein- und frühmetallzeitliche Gräberfunde bei Worms. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 137-142.) Describes, with five figures in the text, the investigation of a prehistoric burial ground near Worms, in which 25 graves were successively discovered. These Adlerberg graves contain remains from four periods (two stone and two metal), and represent largely the transition between the age of stone and that of metal. The skeletons are tall, with mesocephalic skulls, and little evidence of platycnemia. The corpses had the crouched (*hockend*) position.

Lewis (A. L.) The stone circles of Scotland. (Jour. Anthrop. Inst., London, 1900, XXX, N. S. III, 56–72.) A general description (with six figures) of the principal stone circles in Scotland and the Isles. The author notes that "stone circles are still much more plentiful in certain parts of Scotland than in the rest of Britain, but many that formerly existed have been destroyed, and for the most part without any satisfactory description of them having been preserved." In the Aberdeen district more than thirty circles (26 having the peculiar "altar stone") have been listed. Mr Lewis distinguishes three different types of stone circles in Scotland: Western Scottish (irregular ring), Inverness (ring about tumulus), Aberdeen (ring with "altar stone"). Sun and star circles, and possibly other classes, may also be distinguished.

Majewski (E.) Rodzina kruków w mouře projęciach i praktykach ludu polskiego. (Wisła, Warzawa, 1900, XIV, 28–41, 152–179.) A study of the crow (*corvus*) in folk-speech, legend, proverb, tale, and superstition in Poland. The various species of crows are taken up, lists of place-names derived from them, proverbial expression and divers items of folk-belief concerning them given. Poetical references and appearances in myths and legends are also noted in detail.

Makowski (W.) Dożywocie. (Ibid., 241–252.) Discusses with some detail the *dożywocie* or property relation between grown-up children and old parents.

Matiegka (H.) Bericht über die anthropologische Untersuchung der Gebeine Paul J. Šafařík's. (Mitth. d. Anthrop. Ges. in Wien, 1900, Sitzgber., 179–181.) Brief account (with details of measurements) of the condition and characteristics of the skull of Šafařík, the distinguished Slavonic scholar, a Slovak by birth. The investigation took place in connection with the exhuming of his body in May, 1900. The skull is very regular and no anomaly could be detected. The content of the skull was 1738 cubic cm., or nearly 200 cm. above the average.

Meier (S.) Volkstümliches aus dem Frei- und Kelleramt. (Schweiz. Archiv f. Volkskunde, Zürich, 1900, IV, 17–29, 167–173, 221–232, 321–328.) Folklore about birth, childhood, food and meals, clothing, household stuff, care of body, folk-medicine.

Meisner (*Dr*) Scherben mit Fingereindrücken. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 120–122.) Describes, with two figures in the text, a fragment of pottery from the pile-dwellings at Corcelettes (Lake Neuchatel), with impressions of fingertips, including nails. The condition and shape of the nails the author considers valuable anthropological data, according to the views of Kollmann, Minakow and others concerning the relation of nail-types to stature, size, etc.

Meyer (R. M.) Goethe und die deutsche Volkskunde. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1900, X, 1–15.) Discusses from the evidence of his life and writings Goethe's interest in folk-life and folk-lore. The author concludes that Goethe's folk-interest was hardly more than a "Dreingucken."

Montelius (O.) On the earliest communications between Italy and Scandinavia. (Jour. Anthrop. Inst., 1900, XXX, N. S. III, 89–94.) From the consideration of bronze vessels, ornaments, swords, shields (figured in the three plates accompanying the paper), Dr Montelius concludes that "the Italian bronzes imported into Scandinavia were in use contemporaneously in Sweden and in Italy." The third millennium B.C. is none too early for the relations in question in their first developments. These articles traveled to Scandinavia by the amber trade route, and the transit could have been made in two months.

—— Ueber das erste Auftreten des Eisens. (Corrbl. der deutschen Ges. f. Anthrop., München, 1900, XXXI, 142–144.) From present evidence (no remains of iron go back further than the fifteenth century B.C.) iron seems to have been discovered about the middle of the second millennium B.C., probably in the Orient, whence its use reached Europe and the West.

Müllenhoff (K.) Zur Geschichte der Bienenzucht in Deutschland. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1900, X, 16–26.) Interesting sketch of the history of apiculture in Germany. Bee-keeping, charms, folk-lore, laws, etc., are treated.

Nicklin (J. A.) The Greek view of life. (Internat. Jour. of Ethics, Phila., 1900–1901, XI, 227–232.) Protests against the characterization of Greek genius as wholly sensuous,—it reconciled the intellect with the senses.

Pimentel (A.) Os proverbios e a medicina. (A Tradição, Serpa, 1900, II, 65–69, 120–124.) Discusses Portuguese proverbs and popular sayings in relation to medicine, and their hints of scientific truth.

Pineau (L.) Vieux chants populaires Scandinaves de l'âge barbare. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 289–306.) General discussion of the reflection of barbarous life in old Scandinavian songs, with frequent citations in illustration of the theme.

—— Paysans Scandinaves d'autrefois et paysans Français d'aujourd'hui. (Rev. d. Trad. Pop., Paris, 1900, XV, 497–502.) Cites instances of folk-lore to prove "the astonishing likeness" between the Scandinavian peasantry of old [as described in Saxo Grammaticus and Olavus Magnus] and the French peasantry of today.

Piroutet (M.) Contribution à l'étude du premier âge du fer dans les Départements du Jura et du Doubs. (Anthropologie, Paris, 1900, XI, 369–400.) This article, illustrated by 21 figures in the text, discusses in considerable detail the tumuli of the early iron age in the region of the Jura and Doubs and their contents. The author combats the idea formerly very prevalent that these tumuli represented battle-fields, the tombs of fallen Gaulish, Roman, Frankish, and Saracen warriors.

Pitré (G.) Delle feste patronali in Sicilia. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 3–17, 145–168.) A detailed and valuable study of patron saints and their festivals in various cities and towns of Sicily, customs, legends, etc., connected therewith. In the middle of the seventeenth century Palermo had 31 patron saints, and today in 150 Sicilian communes there are 50.

—— Contributo alla bibliografia dei "Contes des Fées" di Ch. Perrault, d'Aulnoy e Leprince de Beaumont in Italia. (Ibid., 256–259.) Titles, with notes, 26 editions of Italian books containing in whole or in part Perrault's "Fairy Tales."

—— Le tradizioni popolari nella *Divina Commedia*. (Ibid., 521–554.) Cites, with explanatory notes and references to literature, 43 passages from Dante's *Divine Comedy*, containing items of folk-lore of various sorts,—customs, games, beliefs, superstitions, legends, proverbs.

Radziukinas (J.) Dzuki. (Wisła, Warzawa, 1900, XIV, 42–54.) An ethnographical sketch of the "Dzukis," of the Government of Suwalki, in Poland.

Regàlia (E.) Sulla fauna della Grotta di Pertosa, Salerno, con un sunto della relativa pubblicazione paletnologica del Prof. G. Patroni. (Arch. p. l'Antrop. e la Etnol., Firenze, 1900, xxx, 25–54.) An account of the finds in the prehistoric grotto-station of Pertosa in the Province of Salerno. To the report on the fauna by Dr Regàlia is added a *résumé* of Prof. Patroni's investigation of the evidences of human habitation. This grotto is remarkable for possessing a pile-dwelling, proof of the efforts of man to contend against the water and the mud of the torrent coursing through it. The station dates at least from the first age of bronze. A similar grotto has recently been discovered in Caggiano, in the same province.

Rehme (——) und **Voght** (V.) Beiträge zur Geschichte des deutschen Volksschauspiels in Schlesien. (Mitteil. d. Schles. Ges. f. Volkskunde, Breslau, 1900, 77–93.) A general account from the archives of Breslau of the folk-drama in Silesia, which lasted till well into the first half of the nineteenth century.

Reinach (S.) Témoignages antiques sur l'écriture Mycénienne. (Anthropologie, Paris, 1900, xi, 497–502.) Discusses passages in Diodorus Siculus and Plutarch, which seem to indicate that the ancient Greeks were not altogether ignorant of the important Mycenian civilization with its graphic system.

Reinecke (P.) Brandgräber vom Beginne der Hallstattzeit aus dem östlichen Alpenländern und die Chronologie des Grabfeldes von Hallstatt. (Mitth. d. Anthrop. Ges. in Wien, 1900, xxx, n. f. xx, 44–49.) During the early stages of the Hallstatt period the region of the eastern Alps, like the whole country from Italy to Scandinavia, affords evidence of the incineration of the dead. The author describes the contents of several grave-mounds of this era, and points out that about 1000 b.c., the finds in the Alps and northward to the North sea and Scandinavia give proof of very close relationship. The most modern graves of the Hallstatt cemetery date from the fourth century b.c.

—— Grabhügelfund von Joschewa in Serbien. (Ibid., 50–52.) From one of two mounds, the only ones in the neighborhood, were obtained a bronze sword and a clay vessel (of a type hitherto unknown in the Balkan region). These finds seem to indicate the extension of Hungarian bronze-work and pottery into parts of the Balkan peninsula during the third and fourth periods of the bronze age.

Rhŷs (J.) On certain wells in Ireland. (Man, London, 1901, 12–13.) Contains extracts from letter of Sir Henry Blake, on tabooed wells and on a sea-calming "knievogue" or little saint.

Ringholz (P. O.) Die Ausbreitung der Verehrung des hl. Meinrad. (Schweiz. Arch. f. Volkskunde, Zürich, 1900, iv, 85–130.) A historico-geographical sketch (with map) of the rise and extension of the worship of St Meinrad (d. 861 a.d.) in Switzerland and beyond its borders.

Salomone-Moreno (S.) Le storie popolari in poesia Siciliana messe a stampa dal secolo xv. ai di nostri. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, xix, 48–64, 327–364.) A detailed bibliography of folk-tales in Sicilian poetry printed from the fifteenth century down to the present time. Thirty-five titles are given, and pages 328–364 are occupied by an alphabetical list of Sicilian folk-poets (numbering more than 200) with brief notices.

Seiler (A.) Kirsche und Kirschbaum im Spiegel schweizer-deutscher Sprache und Sitte. (Schweiz. Archiv f. Volkskunde, Zürich, 1900, iv, 199–213.) Interesting information about German-Swiss names for cherries and cherry-trees, place-names derived from them, cultivation of cherry-trees, property in them, folk-sayings about them.

Simon (T.) Recherches anthropométriques sur 223 garçons anormaux âgés de 8 à 23 ans. (Année Psychol., Paris, 1899 [1900], vi, 191–247.) Details of study of idiotic and feeble-minded children at Vaucluse (Seine). Author concludes that a correlation does exist between physical and intellectual development.

Smólski (G.) Zwycieczki na Mazowsze Pruskie. (Wisła, Warzawa, 1900, xiv, 113–130, 284–298.) Describes a visit in 1899 in Prussian Masovia (the country of the Mazurs), with ethnographic and historical notes. It is from this region that the *mazurka* has its name.

Thomas (N. W.) O mercado de Grillos. (A Tradição, Serpa, 1900, II, 129–130.) Brief discussion of the sale of crickets in various parts of Europe and its significance in folk-lore.

Titelbach (V.) The sacred fire among the Slavic races of the Balkan. (Open Court, Chicago, 1901, XV, 143–149.) This article, with 6 illustrations, treats of the kindling of the "living fire," and is translated from Internat. Arch. f. Ethnogr., XIII, 1–2.

Trotter (A.) Di alcune produzioni patologiche delle piante nella credenza popolare. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 207–214.) Items of folk-belief from various parts of Europe (Italy chiefly) concerning "galls" on oaks, beeches,—"oak apples," etc.,—and their use in folk-medicine.

Tuchmann (J.) La fascination. (Mélusine, Paris, 1900, X, 8–14, 40–46, 68–70, 115–117, 125–127.) Discusses with numerous bibliographical references the prophylaxis and jurisprudence of fascination in ancient and modern times among various peoples.

Udziela (S.) Swiat nadzmysłowy ludu krakowskiego. (Wisła, Warzawa, 1900, XIV, 1–2, 132–144, 253–272.) Items 272–330 of a detailed account of folk-beliefs in and about Krakow concerning the supernatural world.

Vaschide (N.) and **Piéron** (H.) Prophetic dreams in Greek and Roman Antiquity. (Monist, Chicago, 1901, XI, 161–194.) General discussion with literary references.

Virchow (R.) Ueber das Auftreten der Slaven in Deutschland. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 109–115.) Interesting discussion of race-contact in North Germany. The author warns against looking upon all peoples termed *Wends* as Slavs, confesses his inability to state absolutely what is a Germanic and what is a Slavonic skull, and expresses the opinion that, after the emigration of the old stocks in northern Germany, the land was "empty," so the new immigration was no conquest at all.

—— Der Fund einer mit geschlagenen Feuersteinen gefüllten Meermuschel bei Braunschweig. (Ibid., 129–130.) Discusses the finding of a *Tritonium* (the species belongs to the Red sea and Indian ocean) on the hill near Brunswick, where digging for flints had been carried on.

Vital (A.) Der Cudesch da Babania. (Schweiz. Archiv f. Volkskunde, Zürich, 1900, IV, 174–176.) Treats of the "wheel of fortune" consultation on Jan. 6. (Epiphany) in the Engadin.

Wasilewski (L.) Zdziejów zachodniej granicy etnograficznej stowiánskiej. (Wista, Warzawa, 1900, XIV, 13–27.) A statistical study of the Germanization of the Polish borders.

Weinhold (K.) Ueber die Bedeutung des Haselstrauchs im altgermanischen Kultus und Zauberwesen. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 1–16.) According to the author the evidence *résuméd* here indicates that in ancient Teutonic cultus and magic the hazel was a sacred implement, a holy symbol. The hazel-rod was the weapon of the celestial deity and possessed a sacred power which beneficently radiated in all directions among men. The hazel appears as altar-sacrifice, lightning-protector, wind-ward, charm-breaker, shepherd's staff, doctor's rod, wishing-stick, water-finder, magic-staff, rain-charm.

—— Ein hochdeutscher Augensegen. (Ibid., 79–82.) Text from a Cambridge MS. of the twelfth century, of an old High German "eye-charm," with explanatory notes.

Weisbach (A.) Die Deutschen Kärntens. (Mitth. d. Anthrop. Ges. in Wien, 1900, XXX, N. F. XX, 78–96.) Discusses in considerable detail, with maps and tables, the results of the anthropometric investigation (stature, color of hair and eyes, color of skin, head-measurements) of 736 soldiers (individuals with non-German names or "pathological" head-forms excluded) between 21 and 25 years of age. The results are compared with those in the surrounding provinces of Austria, based on the author's investigation of 10,834 subjects altogether. The Carinthian Germans are taller, less brown-haired, more blue-eyed, less white-skinned, less mixed as to blond and brunette types, less brachycephalic and more dolichocephalic than those of the adjoining regions.

Wiedersheim (R.) Organi rudimentali dell'uomo. (Riv. d. Sci. Biol., II, 801–830.) General discussion with numerous illustrations in text.

Wilson (T.) Criminology. (Proc. Amer. Assoc. Adv. Sci., Easton, Pa., 1900, XLIX, 294–300.) A general statement, illustrated with four plates, of the claims of criminology, with the author's reasons for rejecting Lombroso's theory.

Winslow (W. C.) The palace of Minos in Crete. (Amer. Antiq., Chicago, 1901, XXIII, 54–57.) Brief discussion of the recent finds at Cnossus made by Mr A. J. Evans, with their bearings upon Egypto-Ægean relations. The author's conclusion is that "Cretan genius borrowed from Egypt, but beautified and added to it all."

—— The tombs at Abydos. (Ibid., 141–144.) General account, after Petrie, of recent explorations.

AFRICA

Arnaud-Régis (P.) Coutumes et superstitions de la Casamance. (Rev. d. Trad. Pop., Paris, 1900, XV, 325–330.) Items about sorcery, funerals, and marriage from the region of Casamance river in West Africa, peopled by the Mandingos, Diolas, etc.

Balfour (H.) Native smoking-pipes from Natal. (Man, London, 1901, 11–12.) Describes and figures four pipes, in one of which a penny stoneware ink-bottle has been utilized as a bowl.

Delafosse (M.) Sur des traces probables de civilisation Egyptienne et d'hommes de race blanche à la Côte d'Ivoire. (Anthropologie, Paris, 1900, XI, 431–451, 543–568.) These two sections of an extended study, illustrated with 18 figures in the text, deal with the evidence (from houses, clothing, furniture, pottery, tools, gold and metal work, sculpture, bas-reliefs, caricature, music and dance, property and succession laws, condition of women, insignia of power, cosmology, astronomy, medicine, religion, funeral rites, cult of the dead, tombs, etc.) that the Baoulé of the Ivory Coast have been touched in times past by the civilization of ancient Egypt. Some of the alleged identities are accidental, others merely superficial, but in the case of a few of the sculptures, masks, etc., and perhaps in some matters of astronomy and religion, Egyptian influence may ultimately be proved.

Girard (H.) Les Dinkas Nilotiques. (Ibid., 409–429.) After a brief general account of the natives and their country, details (with tables) are given of the various bodily and cranial measurements of three male Dinkas of the Nile.—the Dinkas are a pastoral negro people of tall stature, markedly dolichocephalic, and of average intelligence.

Griffith (F. D.) The system of writing in ancient Egypt. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, 153–159.) A general exposition of the chief features of Egyptian hieroglyphic writing. The author points out how the Egyptians never took full advantage of their great discovery of the alphabetic sign, conservatism, superstition, and the artist-scribes' appreciation of the decorative value of hieroglyphic writing combining to retard progress. He also argues against the alleged acrophonic origin of the Egyptian alphabet, and notes that "in the great decline of taste under Ptolemaic and Roman rule the inscriptions are crowded with fantastic inventions of new values and new signs." The hieratic or cursive writing can be traced back to the first dynasty. There is as yet "no clear evidence that Egyptian writing was either borrowed from or borrowed by any country outside the Nile valley."

Kingston (H. D. R.) Notes on some caves in the T'Zitzikama or Outeniqua district, near Knysna, South Africa, and the objects found therein. (Ibid., 45–49.) These caves contain evidence (shells, implements of bone and stone) of the sojourn of the so-called "strand loopers," who are believed to have preceded the Hottentots in this region. The paper is accompanied by a plate showing 13 specimens of flaked quartzite, worked pebbles, etc.

Koettlitz (R.) Notes on the Galla of Walega and the Bertat. (Ibid., 50–55.) Dr Koettlitz was a member of the Blundell expedition of 1898, which traversed the Somàl-Galla country. Dress, ornaments, weapons, granaries are described. The author also gives (in feet and inches) the mean of a number of anthropological measurements of Abyssinians, Galla, and Bertat.

Le Roy (*Mgr*) Usages des négrilles d'Afrique et des négritos d'Asie. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 117–118.) Items relating to birth, circumcision, adolescence, marriage, death, funerals, etc.

MacIver (D.) Recent anthropological work in Egypt. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, 95–103.) This paper, which is illustrated with six figures in the text and two plates of diagrams, is an interesting attempt by means of the seriation and charting of the results of the measurements of over 1,400 skulls of all periods of ancient Egyptian history (from 5000 B.C. to 500 A.D.), to demonstrate the fluctuations of certain physical characteristics (length and breadth of skull, cephalic, nasal, and alveolar indices) during a long period of time. The course of events, according to Mr MacIver, has been as follows: First people, long-headed, broad-nosed Libyans; some time before the fourth dynasty supplanting of Libyans by Puntites with broader heads and slenderer noses; sixth to twelfth dynasties period of fusion, or mixture of the two stocks; between twelfth and eighteenth dynasties invasion by a narrow-headed, fine-nosed people.

Mochi (A.) Gli oggetti etnografici delle popolazioni etiopiche posseduti dal Museo Nazionale d'Antropologia in Firenze. (Arch. p. l'Anthrop. e la Etnol., Firenze, 1900, XXX, 87–172.) A well-compiled descriptive list (with ethnographic introduction, index, and bibliography of 65 titles) of 88 ethnographic specimens and groups of objects from the native races of northeastern Africa (Erythreans and Abyssinians 64; Danakil, 10; Somàl, 12; Galla, 2). The objects treated of are weapons, implements, personal ornaments, amulets, pictures, etc. Among the facts brought out by the consideration of this collection is "the modifying influence exerted by Semitic invasions and the evidence of ancient contact with Europe."

Packard (A. S.) Prehistoric tombs of eastern Algeria. (Pop. Sci. Mo., N. Y., 1901, LVIII, 397–404.) Describes a visit to the dolmen-field and necropolis of Rocknia and *résumés* theories as to their origin.

Pittard (E.) Note sur deux crânes de Congolais peu connus. (Anthropologie, Paris, 1900, XI, 535–542.) Describes with four figures in the text and measurements in detail, a male skull of the Bayaka and a female skull of the Bassundi, both tribes of the central Congo.

Pope-Hennessy (H.) Notes on the Jukos and other tribes of the middle Benue. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, Anthrop. Rev. and Misc., 24–31.) These notes, made during a journey in 1898, deal with the Tangale, Wuruku, Ligori, and Juko tribes of the middle Benue, a tributary of the Niger. Mode of subsistence, cannibalism, hunting and fighting, clothing, marriage, religion, and "medicine" are among the topics considered. Among the Jukos the custom of king-killing prevails.

Sayce (A. H.) Cairene folklore. (Folk-Lore, London, XI, 354–395.) Some fifteen stories (of nearly all the Cairene text is given) and a large number of items (pp. 379–395), of folk-lore items of every sort. Dr Sayce notes "that comparatively few of the stories are ætiological." Interesting are some traces of the "Arabian Nights," all knowledge of which "is ignored by orthodox Mohammedanism." We also learn that "the folk-lore of Cairo, though largely of Arab origin, has little about it that is distinctly Arab." Much of it is pre-Mohammedan, ancient Egyptian.

di Ujfalvy (C.) Tracce di steatopigia nei Greci della Cirenaica. (Arch. p. l'Anthrop. e la Etnol., Firenze, 1900, XXX, 19–24.) From the condition of the human figures on two cups of Cyrenian origin (dating from the fifth century B.C.), preserved in the National Museum at Paris, the author deduces the existence of steatopygy among the Cyrenian Greeks. This peculiarity of the Cyrenian type the artist has represented in his figures.

ASIA

Basset (R.) Contes et légendes Arabes. (Rev. de Trad. Pop., Paris, 1900, XV, 22–43, 105–114, 143–151, 190–199, 281–288, 353–364, 459–470, 526–542, 606–612, 665–675.) Continued from previous volume. French texts of 223 tales and legends long and short of all kinds, with references to literature.

Basset (R.) Contes et légendes de l'Extrême-Orient. (Ibid., 45-48, 319-323, 403-414, 593-596.) Continued from previous volume. French texts of 25 brief tales and legends from various parts of southeastern Asia and the islands of the Pacific.

Crooke (W.) The legends of Krishna. (Folk-Lore, London, 1900, XI, 1-38.) A general account of the popular legends and myths of the Krishna cult. the neo-Brâhmanic faith of 207,000,000 people in India more or less. The last half of the paper treats: of the origin and real significance of the name *Krishna*, "black, dark." The author thinks the Krishna-legends have absorbed very many folk-beliefs, and that the Dravidian element in them is larger than is generally believed.

Dumontier (G.) Traditions populaires sino-annamites. (Rev. d. Trad. Pop., Paris, 1900, XV, 51-54.) Folk-lore about clouds and water.

Ellon (F.) Verzeichniss der japanisch-buddhistischen Holzbildwerke. (Ethnol. Notizbl., Berlin, 1901, II, 41-57.) List, with explanatory notes, of a collection of 141 specimens of Japanese Buddhistic wood carvings presented to the Royal Ethnological Museum in Berlin by Hr. Ellon. The catalogue is followed (pp. 58-59) by some "Notes" by F. W. R. Müller.

Gale (J. S.) Korean beliefs. (Folk-Lore, London, 1900, XI, 325-332.) Items of folk-lore relating to Hananim (the Korean Great Spirit), mountains and mountain-spirits, islands, lake-spirits and dragons, rivers and streams. The Korean texts of many of the items are given.

Jiriczek (O. L.) Hamlet in Iran. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1900, X, 353-364.) Discusses the resemblances between "Hamlet" and the story of Kei Chosro in the Shah-Nameh, and points of *rapprochement* with other legends.

Krafft (H.) Contes et apologues recueillis au Turkestan russe. (Rev. d. Trad. Pop., Paris, 1900, XV, 644-656.) Twelve fables and three tales (with references to literature) from Mussulmans of Russian Turkestan.

Leclère (A.) Trois contes Cambodgiens. (Ibid., 129-139.) Tales of the adventures of the Guru Parumarta.

Martinengo-Cesaresco (E.) The Hebrew conception of animals. (Open Court, Chicago, 1901, XV, 110-114.) Argues that the Jews did not look on animals as "things" or mere automata.

Matignon (J.) Hystérie et "boxeurs" en Chine. (Rev. Scientif., Paris, 1901, 4^e^ série, XV, 202-204.) The author considers the Chinese as "big children," and emphasizes their *naiveté*, credulity, suggestibility, and impulsiveness. In a sense they are hysterical, epileptoid. The "boxers," moreover, recruit from the very young.

von Schroeder (L.) Ueber die neuen Entdeckungen buddhistischer Alterthümer in Ost-Turkestan. (Mitth. d. Anthrop. Ges. in Wien, 1900, Sitzgber., 119-126.) *Résumés* the discoveries of Buddhistic antiquities in Chinese Eastern Turkestan from the finding of the so-called Bower MSS. in 1889, noting the results of English and Russian explorations. The English collection at Rome contains 23 MSS., from the desert region of Takla Makan,—there are also 45 xylographic books, besides many coins and seals, terra-cottas, clay vessels, figures in stone, metal, etc. The Russian collections include several MSS. in Uigur and Chinese, but the chief results of Russian explorations have been the discoveries of wall-paintings and inscriptions in the cave-dwellings of this region.

Thomas (N. W.) On a pictorial representation of the wheel of life from Japan. (Man, London, 1901, 1-4.) Detailed explanation, with colored plate, of a Buddhist Wheel of Life (the print dates from 1850, but the picture itself is far older). The picture has many Chinese features about it. In Japanese wheels, as compared with Tibetan, the details of Hell, etc., are far simpler.

Zaborowski (M.) La Chine et les Chinois. (Rev. Scientif., Paris, 1901, 4^e^ sér., XV, 161-170.) An historical, ethnographical study of "the oldest of all human societies," embracing more than one-fourth of mankind, from which the white race has yet much to learn. The author approves Schlegel's idea that there is some connection between the ancient astronomy of China and that of Chaldea, but recognizes the originality and development *in situ* of Chinese civilization. There has been much

Zaborowski — *Continued.*
mingling of races in the various regions of the empire, but the ancient type of the Chinese proper is best preserved, according to M. Zaborowski, in that of the Hakkas.

INDONESIA, AUSTRALASIA, POLYNESIA

Agostini (J.) Folk-lore du Tahiti et des îles voisines. Changements survenus dans les coutumes, mœurs, croyances, etc., des indigènes, depuis 70 années environ, 1829–1898. (Rev. d. Trad. Pop., Paris, 1900, XV, 65–96, 157–165.) A very interesting and valuable comparison of the customs and beliefs of the natives of Tahiti as recorded by Moerenhout in 1828, and as observed by the author during three years of personal observation. Costume, toilet, sex affairs, tales and legends, literature, mythology, religion, public and private manners, are treated.

Brown (J. A.) Stone implements from Pitcairn island. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, 83–88.) The axes and chisels of basalt described and figured here are of great interest on account of their specialization in form,—some of them simulate curved copper axes or the medieval European battle-axe of iron. Certain of them suggest relationship with some of the stone implements of Easter island, a view further enforced by the existence on Pitcairn island of large stone images, sculptured pillars, rude carvings in relief on the face of cliffs and in caverns, etc., similar to those found upon Easter island. The author suggests "a racial connection between Easter island and Pitcairn in the past," and advises a search on the latter for tablets with inscribed letters or signs.

Bouchal (L.) Abergläubische Bräuche beim Hausbau in den Preanger-Regentschaften. (Mitth. d. Anthrop. Ges. in Wien, 1900, Sitzgber., 153–154.) Discusses, after Habbema, the house-building ceremonies of certain natives of Sunda. The brief Sundanese text of the rules of building is given with interlinear translation.

—— Indonesische Wertiger. (Ibid., 154–156.) A brief general discussion of werwolf-beliefs in Java, Celebes, etc., based on Knebel and Kruijt.

Calkins (C. G.) Prehistoric politics in the Philippines. (Land of Sunshine, Los Angeles, 1900, XIII, 392–406.) A well-illustrated article based on the writings of Padre Santa Inés (1676), Padre Chirino (1604), etc. At pages 394–395 the Filipino alphabet is given.

Chamberlain (A. F.) Philippine studies. I. Place-names. II. Folk-lore. III. The Tagal language. (Amer. Antiq., Chicago, 1900, XXII, 393–399; 1901, XXIII, 49–54, 145–148.) Discusses etymology of some 40 place-names; enumerates, from various sources, items of religious and social, animal and plant lore; gives Paternoster in Tagal with explanatory vocabulary.

Duckworth (W. L. H.) On a collection of crania, with two skeletons, of the Mori-ori, or aborigines of Chatham islands. With a note on some crania from the same islands now in the museum of the Royal College of Surgeons. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, 141–152.) Describes, with tables of measurements, ten crania (males 8) and two skeletons. The results favor "an affinity with a Polynesian rather than with a Melanesian type," a view agreeing with that indicated by the Polynesian affinities of the weapons and implements of the Mori-ori. The Maori invasion of the Chatham islands in 1835 renders absolute certainty of the provenience of the material necessary before valid conclusions can be drawn.

Edge-Partington (J.) On the origin of the stone figures or incised tablets from Easter island. (Man, London, 1901, 9–10.) Brief review of papers of Thomson and Barclay. Author concludes that history of statues and meaning of inscriptions are no nearer solution than before.

—— Note on an object of unknown use from the Solomon islands. (Journ. Anthrop. Inst., London, 1900, XXX, N. S., III, Anthrop. Rev. and Misc., 37.) Describes, with plate, a *tindalo* representing a deceased ancestor.

—— Note on some feather-mats in the British Museum. (Ibid., 38–39.) Describes, with two plates, two mats and a feather coronet from Hawaii (?).

Fraser (J.) Some Indian words of relationship used by the Australian tribes. (Amer. Antiq., Chicago, 1901, XXIII,

Fraser — *Continued.* 89–98.) The author, who holds that the Australians and Melanesians are the descendants of the original stratum of population in the Indo-Pacific region, after whom came Caucasians, then Malays, seeks to prove the existence of an Indian element in the languages of Australia, etc., seen especially in certain terms of relationship. The "aboriginal blacks" of southern Hindustan he believes to be the close kin of the Australians. The case is more venturesome than proved.

Hahl (*Dr*) Mittheilungen über Sitten und rechtliche Verhältnisse auf Ponape. (Ethnol. Notizbl., Berlin, 1901, II, 1–13.) Brief account, by the Vice-Governor, of religion, beliefs about the soul, social classes, titles, family and property law among the natives of Ponape, one of the Carolines. This paper is followed by a lengthy discussion (pp. 14–40) apparently by A. Bastian.

Karutz (*Dr*) Weitere Bemerkungen zur Ethnographie der Matty-Insel. (Internat. Arch. f. Ethnogr., Leiden, 1900, XIII, 217–223.) According to the author the Matty Island people are "a Polynesian *enclave* of Melanesia." Race-mixture and foreign influences exist, but originality has not been extinguished. Matty culture shows Caroline Islands affinities.

Rae (John) Laieikawai: A legend of the Hawaiian Islands. (Journ. Amer. Folk-Lore, Boston, 1900, XIII, 241–266.) A story "possessing the compass of a modern novel," the chief part of which is printed from a MS. of the late Dr John Rae dating *circa* 1855. The text differs in some respects notably from that given in King Kalakaua's Legends and Myths of Hawaii, and Dr Rae gives the *mele* or song of the sisters which does not appear in the book, being only alluded to there. The tale takes its name from the heroine, and may be four hundred years old, probably less.

Rivers (W. H. R.) A genealogical method of collecting social and vital statistics. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, 74–82.) This essay, with the two genealogical charts (one from Murray island, the other from Mabinag), exemplify the possibility of collecting social and genealogical data from uncivilized races such as those of Torres straits, where Dr Rivers' researches were carried on. Such data will be a welcome aid to the thorough study of kinship systems, while at the same time they illustrate the social customs, etc., connected with names. The "genealogical method" is a means for utilizing "the store of information which the extraordinary memory for detail of the savage has enabled him to accumulate." The savage's memory for names "is as highly developed as in any European, and far more so than in those Europeans who are accustomed to abstract thinking."

Sierich (*Dr* O.) Samoanische Märchen. (Internat. Arch. f. Ethnogr., 1900, XIII, 223–237.) First part, with good introduction, of a collection of Samoan tales made on the spot by the author. Text in native language and accurate translations are given. The *Tagogos*, or poetic tales here recorded antedate missionary influence. One of the three tales published in this article is concerned with albinos.

Zdekauer (A.) Ueber Schädeltrepanationen im Bismarck-Archipel. (Mitth. der Anthrop. Ges. in Wien, 1900, Sitzgber., 116–117.) Describes (three are figured in the text) four trepanned skulls from the Bismarck archipelago. The operation is performed with a stone chisel.

AMERICA

Anthony (Frances). An Indian well. (Land of Sunshine, Los Angeles, 1901, XIV, 121–125.) Describes, with illustrations, an Indian well (an old camp-site) in the Colorado desert.

Ayer (*Mrs* E. E.) Early western history. Benavides's Memorial, 1630. (Ibid., 1900, XIII, 345–358, 435–444; 1901, XIV, 39–52, 137–148.) Continuation of this valuable translation of an important ethnographic document, rendered indispensable by the editorial notes of Chas. F. Lummis and the annotations of F. W. Hodge.

Bagley (W. C.) On the correlation of mental and motor ability in school-children. (Amer. Journ. Psychol., Worcester, 1901, XII, 193–205.) From studies of some 160 Madison (Wis.) school-children the author "does not find such a direct relation between weight and mental ability as Porter found in

Bagley — *Continued.*
his investigations upon St Louis schoolchildren." A "significant trend toward an inverse relation between mental ability and head-girth" is noted. Boys slightly surpass girls in motor, but not in mental, ability.

Barrows (D. P.) The desert of the Colorado. (Land of Sunshine, Los Angeles, 1900, XIII, 312–322.) Contains some references to the Coahuia Indians.

Barrows (Mabel H.) "Hiawatha" among the Ojibwa Indians. (Southern Workman, Hampton, Va., 1901, XXX, 771–776.) Account of "Hiawatha," pantomimic tableau performed by the Indians of Garden river, Ontario, for the benefit of the family of Longfellow. The performance was "rather a reminiscence of their own early life than an adaptation of the poem."

Beauchamp (W. M.) Onondaga tale of the Pleiades. (Journ. Amer. Folk-Lore, Boston, 1900, XIII, 281–282.) Recounts the origin of the seven stars from "a pretty band of dancing children." The moral is "feed children well." The Pleiades are the favorite constellation of the Iroquois.

Benedict (A. L.) Mound-builder remains on Cattaraugus creek, Erie county, N. Y. (Amer. Antiq., Chicago, 1901, XXIII, 99–105.) Account of character and contents of two mounds, investigated by the author (for the Pan-American Exposition) in August and September, 1900. A sacrum found in one of these mounds is conjectured to belong to a musk-ox (?). A map and plans accompany the article.

Blue (A.) Notes on skulls taken from a pre-historic fort in Kent county. (Proc. Canad. Inst., Toronto, 1901, II, 93–95.) Describes briefly (a few measurements are given) seven skulls from an ossuary not far from the shore of Lake Erie in Kent county, Ontario. Two different Indian races are represented, and the tree-circle method indicates a period for the oldest burial antedating the Columbian discovery by about a century.

Boas (Franz) A bronze figurine from British Columbia. (Bull. Amer. Mus. Nat. Hist., N. Y., 1901, XIV, 51–52.) Description (with plate) of specimen found at Kincolith in northern British Columbia, whither it probably passed by way of the Manila-Acapulco trade some time before the close of the eighteenth century. The object in question seems to be the handle of a ghaṇṭâ, or bell used by the Brâhmana in the Pûjâ ceremony.

Brinton (D. G.) Catalogue of the Berendt linguistic collection. (Bull. Free Mus. Sci. and Art, Phila., 1900, II, 203–234.) Briefly describes 183 books and MS. (mostly the latter), now in the Library of the Free Museum of Science and Art, University of Pennsylvania, relating to the languages of Mexico and Central America. Printed as the late Dr Brinton left it.

Burns (L. M.) "Digger" Indian legends. (Land of Sunshine, Los Angeles, 1901, XIV, 130–134.) First part of an account of legends of the Scott Valley Indians of northern California: "Why the Animals are Warm-Blooded," and "The Stealing of the Fire."

Campbell (R. F.) Classification of mountain whites. (Southern Workman, Hampton, Va., 1901, XXX, 110–116). Rather popular account of the various classes of the inhabitants of "Appalachian America." The author holds to the "driftwood" or "deposit" theory of the origin of these people.

Chamberlain (A. F.) Some items of Algonkian folk-lore. (Journ. Amer. Folk-Lore, Boston, 1900, XIII, 271–277.) Alphabetical enumeration, with explanatory comments, of folk-lore items from Cuoq's Lexique de la langue algonquine.

Chamberlain (Lucia S.) Plants used by the Indians of eastern North America. (American Naturalist, Boston, 1901, XXXV, 1–10.) Enumerates (in some cases the Indian names are given) plants used by the various tribes of the Iroquois and Algonquians for food, medicine, ornament, artistic and manufacturing purposes, etc. The arrangement of plant-names is alphabetic under each tribe-name, and a bibliography of 40 titles is appended.

Cibele (Angela N.) Folk-lore di San Paulo nel Brasile. Alcune parole usate dalla populazione mista Italiana e Negra nelle "fazende" di S. Paulo nel Brasile. (Arch. p. l. Stud. d. Trad. Pop.,

Cibele — *Continued.*
1900, XIX, 18–24.) Last article on the topic. An alphabetic list of words in use among the Italian-Negro population of the "fazendas" of S. Paulo, Brazil. The list contains a number of words of Indian origin.

Culin (S.) The Dickeson collection of American antiquities. (Bull. Free Mus. Sci. and Art, Phila., 1900, II, 113–168.) Account of archeological investigations of Dr M. W. Dickeson in 1842–1843 in Mississippi and Louisiana, with a list of the specimens from his collection now in the Free Museum. Many of the mounds described have long since disappeared.

Dalton (O. M.) Note on a stone figure from Colombia, S. America. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, Anthrop. Rev. and Misc., 64.) Very brief account (with two plates) of statue of warrior, pre-Columbian in date, and obtained in 1899 from San Augustin. These statues are said to be quite numerous in the region about the upper Magdalena river.

—— Note on a copper shield from the N. W. Coast of America. (Ibid., 47.) Very brief account (with figure) of *tau*-shield from Stickeen tribe.

Dixon (R. B.) The musical bow in California. (Science, N. Y., 1901, N. S. XIII, 274–275.) Notes the occurrence of a form of this instrument among the Maidu Indians, used by shamans. Author favors Amerindian origin of musical bow.

—— Some Coyote stories from the Maidu Indians of California. (Journ. Amer. Folk-Lore, Boston, 1900, XIII, 267–270.) Four tales,—"Coyote and Grizzly Bears," "Coyote and Fleas," "Coyote and the Gray Fox," "How the Coyote Married his Daughter,"—collected in 1899 from the Koyoma or Maidu of the Sierra.

Dorsey (G. A.) The Stanley McCormick Hopi expeditions. (Science, N. Y., 1901, N. S. XIII, 219–222.) Brief account of the expeditions of 1899–1900 for the exploration of the Hopi or Moqui ruins and of the Hopi material now in the Field Columbian Museum, Chicago.

—— An aboriginal quartzite quarry in eastern Wyoming. (Field Columb. Mus., Chicago, Dec., 1900, Anthrop. Ser. II, 232–243.) Describes, with 12 plates, the situation, condition, and products of an aboriginal quartzite quarry in Converse county, Wyoming. The quarry belonged to some tribe of Plains Indians, and dates "within a comparatively recent period, but before the advent of the white race in this region."

—— Games of the Makah Indians of Neah bay. (Amer. Antiq., Chicago, 1901, XXIII, 69–73.) Describes 11 games upon information derived from intelligent young Indian. The materials used in these games bring out notably the effect of seashore environment. Interesting is the modification "from the original buckskin ball of the Plains or Mountain Indians to a ball of whalebone." The game itself, in this case, "has become intimately bound up with the celebration of the capture of a whale."

Doubleday (N. de G.) Aboriginal industries. (Southern Workman, Hampton, Va., 1901, XXX, 81–85.) Argues for the preservation and revival of Indian arts, some of which are now lost or nearly so, by the adaptation of Indian industry to white men's needs.

Dowde (J.) Art in negro homes. (Ibid., 90–95.) General account of the art-contents of 25 negro homes in the city of Durham, N. C.

Duckworth (W. L. H.) and **Pain** (B. H.) A contribution to Eskimo craniology. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, 125–140.) This article (furnished with tables and two plates) gives the results of measurements of eleven adult males and ten adult females (Labrador Eskimo on exhibition in London in the winter of 1899–1900), compared with those of from seventeen to twenty skulls of adult males and from eight to eleven skulls of adult females (all eastern Eskimo). Ten Eskimo skulls in the Anatomical Museum at Cambridge are also included. At the end of the article are some "Miscellaneous Notes" by Mr R. G. Taber on these Labrador Eskimo. Among the peculiarities noted with more or less frequency in Eskimo skulls are: Scaphocephalism, persistence of certain sutures, asymmetry of *foramen magnum*, wearing down of teeth, thickening of body of mandible,

Duckworth — *Continued.*
etc. Early appearance of certain characteristics (retention of infantile characters) also occurs.

Edge-Partington (J.) Floats for alluring salmon, from the north end of Vancouver island. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, Anthrop. Rev. and Misc., 49.) Brief description, with figures, from lists in British Museum.

Fewkes (J. Walter) A theatrical performance at Walpi. (Proc. Wash. Acad. Sci., 1900, II, 605–629.) A good description (with three plates) of the six "acts" and occasional additional performances of "the great serpent drama" of the Hopi Indians, as rendered at the Pueblo of Walpi in the spring of 1900. The paper includes also notes on paraphernalia, a *résumé* of events in the Palûlûkoñti ceremony, and interesting views of the significance of primitive drama. The drama here described is "in the main, theatrical and secular, performed for instruction or entertainment." An important point is Dr Fewkes' belief that "the Great Serpent cult in Tusayan and among the Toltecs had a common origin," the Tlapallan of the latter having been in southern Arizona, or northern Mexico.

Fletcher (Alice C.) Giving thanks: a Pawnee ceremony. (Journ. Amer. Folk-Lore, Boston, 1900, XIII, 261–266.) Interesting account — the rite has seldom, if ever, been witnessed before by members of the white race — of a ceremony of thanks to Tiráwa (the chief deity of the Pawnees) "for power granted to medicine given by an old priest to the wife and child of a young man." Belief in the efficacy of medicine, position of doctor, meaning and purpose of fees are touched upon.

Gérin (L.) The Hurons of Lorette. (Trans. Ottawa Lit. and Scientif. Soc., 1899–1900, 69–92.) General historical and ethnographic discussion of forms of labor, property, and family. The author notes the intermarriage of Hurons with white women, and the potent influence of the latter; the alteration of the physical type of the old Hurons; the passing of the Huron language, and the old Huron dress, mode of living, etc. Of the Iroquois of Caughnawaga, as compared with the Hurons of Lorette, he says that the former "instead of being weakened by foreign intrusion have been strengthened by it" (p. 90).

Gleason (F. D.) Social life among the Indians. (Southern Workman, Hampton, Va., 1900, XXIX, 565–568; 1901, XXX, 156–159.) The first article treats of Indian hospitality and its survivals, the second of burials among the Omahas of eastern Nebraska.

Hagar (S.) The Peruvian star-chart of Salcamayhua. (Proc. Amer. Assoc. Adv. Sci., Easton, Pa., 1900, XLIX, 320–321.) Abstract of "the first of a series of articles upon the symbolic astronomy of the ancient Peruvians." The author considers the chart pre-Columbian.

Halbert (H. S.) Prehistoric earthworks in Noxubee county, Mississippi. (Amer. Antiq., Chicago, 1901, XXIII, 139–141.) Describes two "forts," probably built by the Choctaws as barriers against Muskogee invasion.

Hastings (W. W.) Anthropometric studies in Nebraska. (Amer. Phys. Ed. Rev., Boston, 1900, V, 53–66.) From study of 2500 school children of Lincoln, and 10,000 of Omaha, the author concludes that Porter's views as to correlation between intellectual and physical development are correct.

Hatcher (J. B.) The Indian tribes of southern Patagonia, Terra del Fuego, and the adjoining islands. (Nat. Geogr. Mag., Washington, 1901, XII, 12–22.) Notes on the Tehuelches, Onas of the Plains, Channel Indians, with illustrations (Tehuelche brave, squaw, etc.). The author notes that marriages of white men and Tehuelche women are more prolific than marriages of Indians. The effects of the advent of the horse are referred to. The Yahgans are considered a people who have been driven to the wall.

Holden (*Mrs* M. E. R.) A relic of Thayendanegea. (Papers and Records Ontario Hist. Soc., Toronto, 1901, III, 113–116.) Describes Capt. Brant's war-banner, ring, and watch.

Hunter (A. F.) The ethnographical elements of Ontario. (Ibid., 180–199.) The first attempt of any consequence to delimit ethnographically the settlement of the Province of Ontario according to race. The settlements or groups of the original rural population are given in tabular form. A valuable paper.

Johnson (J.) Canada's northern fringe. (Trans. Ottawa Lit. and Scientif. Soc., 1899–1900, 9–68.) A historical-geographical account of the "District of Franklin," by which name, since 1895, the Arctic islands belonging to Canada have been designated in honor of the famous explorer. The origin of many place-names is given.

La Flesche (F.) The Laughing bird, the wren. (Southern Workman, Hampton, Va., 1900, XXIX, 554–556.) Omaha story of how the wren defeated the eagle and won its name, *Kíhahaja*, the "laughing bird."

—— The story of a vision. (Ibid., 1901, XXX, 106–109.) A tale of Omaha boy-life.

Lehmann-Nitsche (R.) Ueber den fossilen Menschen der Pampaformation. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 107–109.) Brief *résumé* of our present insufficient knowledge of fossil man in the Pampas. The author believes the pieces of burnt clay found in the middle *löss* to be of human origin.

Lewis (Frances W.) Life among the Pueblos. (Southern Workman, Hampton, Va., 1901, XXX, 757–760.) Brief general account of Indians of various pueblos of New Mexico and Arizona.

Lewis (T. H.) Sculptures in caves at St. Paul, Minnesota. (De Lestry's Western Mag., St. Paul, 1901, VI, 229–233.) Describes, with 12 figures in the text, sculptures of human beings, animals, etc., in Dayton's Bluff, Carver, and other caves within the city of St Paul. The sculptures in Carver Cave (of which but few were in good condition in 1878) were thought to be "very ancient" by Capt. Carver, who saw them in 1766. The author's investigations were made mostly in 1878, and it is fortunate that he made the copies here reproduced.

—— The De Soto expedition through Florida. (Amer. Antiq., Chicago, 1900, XXII, 351–357; 1901, XXIII, 107–111.) Abridged translation, with notes, of the Ranjel-Oviedo account of the expedition of 1839.

McGee (W. J.) Amerind—A designation for the aboriginal tribes of the American hemisphere. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, Anthrop. Rev. and Misc., 44–45.) A brief account of the origin of *Amerind* and reasons for its adoption.

McGhee (Z.) A study in the play-life of some South Carolina children. (Pedag. Sem., Worcester, 1900, VII, 457–478.) Detailed account of the age and sex relations of 134 games of all sorts as played by 8,718 South Carolina children, 6–18 years old.

Mason (O. T.) Traps of the Amerinds: a study in psychology and invention. (Proc. Amer. Assoc. Adv. Sci., Easton, Pa., 1900, XLIX, 301–313.) This excellent paper has appeared in full in the American Anthropologist, 1900, II, 657–675. It deals with all aspects of the trap among the American Indians.

Nuttall (Zelia) The meaning of the ancient Mexican calendar stone. (Ibid., 320.) Brief abstract. Author holds that "a single, primitive cosmical scheme and plan of government prevailed through ancient America, this scheme being identical with the primitive Old World scheme.

Patrick (G. T. W.) The psychology of profanity. (Psychol. Rev., N. Y., 1901, VIII, 113–127.) General discussion of the history and nature of profanity. According to the author "the human analogue of the [animal] growl or roar of anger is the profane oath." Profanity is a form of instinctive reaction.

Peet (S. D.) Architecture in the stone age. (Amer. Antiq., Chicago, 1900, XXII, 367–382.) Illustrated discussion of buildings of the "stone age," chiefly in North America. The author holds to the Mongolic affinities of the ancient Babylonians.

—— Toltec cities and Toltec civilization. (Ibid., XXXIII, 1901, 33–47.) Illustrated article of general nature. Author takes too high a view of "Toltec" culture.

—— Mexican and Maya architecture. (Ibid., 113–136.) General discussion, with numerous illustrations, of the resemblances and differences of Mexican and Central American architecture. The author thinks the ancient Mexicans borrowed much from the Mayas.

Pepper (G. H.) The Navajos. (Southern Workman, Hampton, Va., 1900, XXIX, 639–644.) Brief ethnological sketch. According to the author, "the

Pepper — *Continued.* sheep that the Spaniards introduced were destined to work out the Navajos' salvation."

Preuss (K. T.) Der Affe in der mexikanischen Mythologie. (Ethnol. Notizbl., Berlin, 1901, II, 66–76.) In this paper, which is accompanied by 43 figures in the text (from pottery, codices, etc.), the author discusses the rôle of the monkey in ancient Mexican mythology. The "monkey ear" of certain figures, monkey-shaped rattles and bells, the connection of the monkey with *pulque*, with death, with fertility and the earth, etc., are touched upon.

Rakestraw (C. D.) The Shaker Indians of Puget sound. (Southern Workman, Hampton, Va., 1900, XXIX, 703–709.) Brief general account of John Slocum, the founder of the "Shaker religion" among the Puget Sound Indians, and the system itself, "a combination of Protestantism, Catholicism, and Christian Science." The author writes from personal observation.

Riggs (F. R.) Peculiarities of Indian education. (Ibid., 1901, XXX, 66–71.) Discusses some of the peculiarities of Indian children in the schoolroom. Notes the power of custom and habit. According to the author the Dakota *hanke* acquired its present meaning of "half" from the whites, having meant originally "part" only.

Rogers (F. K.) The rain-dance of the Arapahoes and Cheyennes. (Ibid., 1900, XXIX, 721–723.) Brief account of dance as performed by these Indians near El Reno, Oklahoma.

Rowe (G. C.) The negroes of the Sea islands. (Ibid., 1900, XXIX, 709–715.) Brief general sketch of present conditions of the negroes of the South Carolina coast islands.

Russell (F.) Studies in cranial variation. (American Naturalist, Boston, 1900, XXXIV, 737–745.) Gives results of examination of some 2000 Amerindian skulls, in the Peabody Museum at Harvard, as to metopic suture, tympanic exostoses, frontoparietal, parietal, epactal bone, platybasis, jugular process, Aymará fossa, fused atlas, *torus palatinus.* Statistical tables and two pages of illustrations are given.

Slocum (C. E.) A civilized heredity stronger than a savage environment. (Proc. Amer. Assoc. Adv. Sci., Easton, Pa., 1900, XLIX, 316–317.) The author considers the thesis proved by the history of Frances Slocum, taken captive by the Delawares in 1778, and for 59 years resident in an Indian environment. Here heredity triumphed psychically, and in one of the youngest great-granddaughters from Indian marriages "the dark auburn hair of the captive" appears atavistically.

Smith (Harlan I.) The archæology of the southern interior of British Columbia. I. Introduction. (Amer. Antiq., Chicago, 1901, XXIII, 25–31.) Treats of geography, archeological sites, resources of the prehistoric peoples of the region about Lytton, Spences Bridge, and Kamloops. The paper is extracted from Vol. II of the Memoirs of the American Museum of Natural History.

—— The cairns of British Columbia and Washington. (Proc. Amer. Assoc. Adv. Sci., Easton, Pa., 1900, XLIX, 313–315.) Abstract. See next title.

Smith (H. I.) and **Fowke** (G.) Cairns of British Columbia and Washington. (Mem. Amer. Mus. Nat. Hist., N. Y., Jan., 1901, IV, Anthrop., III, ii, 56–76.) This excellent memoir, with map, 5 beautiful plates, and 9 figures in the text, describes with detail nature and contents of numerous cairns on southeastern Vancouver island, the San Juan group, and Whidbey island, which antedate the coming of the whites. A careful and well-digested study.

Smyth (J. H.) Negro criminality. (Southern Workman, Hampton, Va., 1900, XXIX, 625–631.) Appeals for reform in home-training as a preventive of crime.

von den Steinen (K.) Der Paradiesgarten als Schnitzmotiv der Payaguá-Indianer. (Ethnol. Notizbl., Berlin, 1901, II, 60–65.) This interesting paper, with four illustrations, describes the carvings on four "medicine-pipes" of the Payaguás now in the Ethnological Museum. The carvings represent the Paradise of the Old Testament, doubtless after missionary ideas rudely assimilated.

Strobridge (Idah M.) Lo's Turkish bath. (Land of Sunshine, Los Angeles, Strobridge — *Continued.* 1901, XIV, 13-19.) Describes, with illustrations, the "sweat house" of the Piutes.

Trotter (C.) Extracts from the diary of Mr James Strange, H. E. I. C. S., commanding an expedition sent by the East India Company to the northwest coast of America in 1786; with a vocabulary of the language of Nutka Sound. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, Anthrop. Rev. and Misc., 50-62.) Pages 50-58 are occupied with extracts from the diary, pages 56-61 by "Additions to Captain Cook's Vocabulary of the Nootka Sound language," pp. 61-62, by a "Vocabulary of the Prince William's Sound language," and there are added to the article brief "Notes on the above vocabulary" by N. W. Thomas. Mr Strange's word-list "is four times as numerous as Captain Cook's, and includes the numerals." Mr Coutts Trotter is the grandson of Mr Strange. The diary and vocabulary seem never to have been published, so the added linguistic material is very welcome.

Upham (W.) Derivation and antiquity of the American race. (Amer. Antiq., Chicago, 1901, XXIII, 81-88.) Author gives his reasons for believing that "the first American peoples migrated to our continent from northeastern Asia during the early Quaternary time of the general uplift of northern regions," and this inflow of man spread south to Cape Horn, mingling on the way with "another line of very ancient immigration, in the same early Pleistocene or Quaternary time, from Western Europe."

Wardle (H. N.) Notes on the designation *Atna.* (Ibid., 137-139.) Sums up the evidence as to the Atna or Ahtenne. Author concludes that there are "two tribes known as Atnah, one to the northwest, the other in the southwest, a Tinné and a non-Tinné people." The name *Atna* seems to be related to *gdelt'un*, "glacier," in certain Athapascan dialects, hence perhaps "glacier people."

—— The Sedna cycle: a study in myth evolution. (Proc. Amer. Assoc. Adv. Sci., Easton, Pa., 1900, XLIX, 317-318.) Abstract of a paper published in full in the American Anthropologist, 1900, II, 568-580.

Willoughby (C. C.) Prehistoric workshops at Mt Kineo, Maine. (American Naturalist, Boston, 1901, XXXV, 213-216.) Gives an account, with three plates, of the results of two investigations of the porphyritic felsite rejects and other relics about the great cliff of Mt Kineo. The condition of the material indicates that the process of finishing was undertaken after transportation to other places. The presence of completed implements of material derived from Mt Kineo all over the valleys of the Kennebec and Penobscot corroborates this view.

Wintemberg (W. J.) German-Canadian folk-lore. (Papers and Records Ontario Hist. Soc., Toronto, 1901, III, 86-96.) Items of folk-lore from the German population of Ontario, relating to folk-medicine, luck, weather, fauna and flora of the country, heavenly bodies, thunder and lightning, holidays, witchcraft, etc.

Work (M. R.) Crime among the negroes of Chicago. (Amer. Journ. Sociol., Chicago, 1900, VI, 204-223.) Statistics 1872-1897 are discussed according to sex, age, offences. Author holds that "the fact of the negro being in a transitional state, and the economic phase of this transition, account for a large part of the excess of negro crime in the United States."

NOTES AND NEWS

Archeological Survey of Michigan.[1]—Owing to the desire on the part of students for such study and to support by Prof. Francis W. Kelsey of the Latin department, a full course in museum work in American archeology was offered at the University of Michigan under Prof. Kelsey's general direction, beginning the second semester in the college year 1891–92.[2] Two students availed themselves of this opportunity and some of the laboratory work was done on Michigan material. Regular university credits were given in both that year and the one following, but the course is no longer offered.

In 1893 and 1894, as a direct outgrowth of the interest in the course and the coöperation with the university of the Detroit branch of the Archeological Institute of America, several surveys were made of the prehistoric earthworks known as "garden beds" near Kalamazoo. From these data one of the groups was modeled for the University museum, and copies were taken by the Peabody Museum and the American Museum of Natural History.

The Michigan Academy of Science was organized in the fall of 1894 and at the first meeting, December 26, 1894, the anthropology of the state was represented by a paper on one branch, "The Data and Development of Michigan Archeology." This paper was published in two parts; the first, referring to the data, together with a note predicting future activity on the part of the state in the preservation and study of its archeologic resources, appeared in *The American Antiquarian*, May, 1896, while the second, referring to the development of Michigan archeology, was published simultaneously at the University in *The Inlander*. This paper pled for the subject, suggesting a general plan of action, particularly that the work be systematic and directed by some public institution, such as the State University, where the results could be assembled for study and permanent free public exhibition; and that the antiquities of the state should be photographed, surveyed, and plotted. Later a plea for inclosing mounds in public parks, cemeteries, etc., was published in the local papers.

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[1] Presented before the Michigan Academy of Science at its seventh annual meeting, Ann Arbor, March 28, 1901.

[2] See "Anthropological Work at the University of Michigan," *Memoirs of the International Congress of Anthropology*, Chicago, 1894; also *University Record*, February, 1894.

In 1900 the Detroit branch of the Archeological Institute of America appointed a committee composed of James E. Scripps, owner of the *Detroit News-Tribune;* Prof. Francis W. Kelsey, of the University of Michigan; George W. Bates, President of the Detroit Archeological Society; Hon. William E. Quinby, owner of the *Detroit Free Press;* and Levi L. Barbour, and instructed it to prepare and to have passed by the state legislature a bill establishing a survey of the antiquities of Michigan and to make appropriations therefor. After careful consultation with members of the American Museum of Natural History, Bureau of American Ethnology, and United States National Museum, as well as with those who conducted the archeological exploration for the New York State University and the Ohio Historical Society, this bill was prepared.

At the meeting of Section H of the American Association for the Advancement of Science, at Johns Hopkins University in 1900, a committee was appointed to transmit a suitable memorial to the people of Michigan, expressing approval of the establishment of the proposed survey and tendering its coöperation.

The following is a copy of the memorial transmitted:

To the Senate and House of Representatives of the General Assembly of the State of Michigan:

RESOLVED: by Section H of the American Association for the Advancement of Science, at its meeting held at Baltimore, December 28–29, 1900, that the proposed Archeological Survey of the state of Michigan is highly desirable; that we approve the same and hope it will soon be pushed to completion. We recommend that the work be placed in charge of an experienced archeologist, with an advisory board of archeologists the members of which shall serve without pay, the results of which inquisition to be preserved by publication.

THOMAS WILSON, *Chairman.*
GEO. A. DORSEY } *Members of*
FRANK RUSSELL } *Committee.*

The bill which was presented early in the present year is as follows:

A BILL *Establishing a survey of the antiquities of Michigan and making appropriations by fiscal years therefor.*

The People of the State of Michigan enact:

SECTION 1. That a survey of the antiquities of Michigan be and the same is hereby established.

SECTION 2. That the survey shall be in charge of a commission comprising the Governor of the State ex officio, the President of the University of Michigan, the President of the Michigan Academy of

Science, the President of the Pioneer and Historical Society, and the President of the Detroit Archeological Society, this commission to serve without compensation, but to be reimbursed for their actual and necessary expenses.

The commission shall have the power to employ an archeologist and one or more assistants and to make such incidental expenditures as the nature of the work may require. The accounts for salaries and other expenses provided herein shall be paid upon the warrant of the Auditor-General monthly upon the approval of the Governor. At the end of each fiscal year the commission shall cause to be made an annual report, the copy for which, as soon as completed, shall be forwarded to the clerk of the Board of State Auditors for publication by the State Printer, the expense of such publication to be paid from the general fund of the State upon the allowance of the Board of State Auditors.

SECTION 3. For the purpose of carrying out the provisions of this act, exclusive of the cost of publishing the annual reports, there is hereby appropriated from the general fund of the State for the fiscal year ending June thirty, nineteen hundred and two, and each fiscal year thereafter, the sum of two thousand five hundred dollars.

The committee on state affairs has reported the bill favorably, but it has been amended by limiting it to two years. This will require a somewhat different mode of field work and an effort to have the survey perpetuated at the end of two years either by state or private aid. The bill is now in the hands of the committee on ways and means.

Should the bill pass it will be necessary to enlist the services of an archeologist to direct the survey who not only has field experience and will avoid the pitfalls so often fatal to such undertakings, but one who can also bring about the reëstablishment of anthropologic work in the University curriculum. The latter important object could easily be effected by offering a few lectures the first year, supplemented the second by laboratory work on the results of the survey. This plan would not only furnish material for the students, but would further the interests of the survey by their preparation of its material. These students could later be employed in special field research during the summer, and in the laboratory prepare the material and collate the results for theses. The director should also give popular lectures throughout the state in order to develop general interest in the subject.

Should the bill fail to pass it is still significant that interest in the subject should have reached this stage. With the large number of influential and thoughtful people now striving for this survey as part of a permanent anthropological institution in Michigan, and with the increased public interest which they have aroused, the subject has now a larger constituency in the state than ever before.

HARLAN I. SMITH.

Twined Weaving.— In Professor Mason's note on "Woven Basketry: a Study in Distribution," on pp. 771–73 of the last number of the *American Anthropologist*, he gives the geographical distribution of twined weaving in America as follows: "It commences with the island of Attu and continues down the Pacific coast of America to the borders of Mexico with some interruptions, and extends into the Great Interior basin with the Ute. Otherwise it does not exist in North America excepting in association with prehistoric pottery in Pope county, Tennessee, in Macon, Georgia, in Arkansas, and in Illinois, as may be seen by examining Holmes' illustrations in the *Third Annual Report* of the Bureau of Ethnology, pp. 408–413."

He also refers to figures of twined weaving in Holmes' paper in the *Thirteenth Annual Report* of the Bureau of Ethnology, and, continuing, says: "There is not a specimen in the United States National Museum of any sort from Central or South America. In the codices as well as in the beautifully illustrated books of Stübel, Reiss, and Uhle, not one example contains this compound weft. In other words, in my limited study, no twined weaving was ever done in America south of the present boundary of the United States."

The simplest form of twined weaving (style A) in which the warp elements form the body of the cloth, mat, or basket, and in which the twisted woof elements, placed at intervals, are used simply to bind the warp elements together, is probably one of the earliest and most widely distributed forms of weaving. We must seek its origin in fish weirs and other coarse wattle-work where inflexible rods were held firmly in rows by twisted twigs or vines. It was probably applied to the finer forms of basketry and matting later, and its use in holding together untwisted bast and the fiber of plants, as well as cords of twisted vegetal fiber must have occurred in the very first stages of cloth manufacture.

In the second form of twined weaving (style B) the twisted pairs of woof elements are pressed close together and the warp elements do not show conspicuously. This style was applied principally to basketry but was also used in the manufacture of cloth.

Of the more complicated forms of twined weaving the Peabody Museum possesses excellent examples, principally from the area given by Professor Mason. The following localities represented by collections in the Peabody Museum at Cambridge, showing distribution of the two simpler forms, may be added to Professor Mason's list:

Iroquois Indians, cornhusk basketry (style B); Mounds of Ohio, charred cloth (styles A and B); Prehistoric burial caves, State of Coahuila, Mexico, cloth and matting, several examples (A); Tlaxcala Indians, central Mexico, sling (B); Prehistoric graves at Ancon, Peru, matting both coarse and fine (A), baskets (B); Prehistoric graves at Arica, Chile, small wallets of basketry (A); Graves at Pisagua, Chile, basket (A); Guato Indians, southern Brazil, excellent examples of Mosquito mantles (A); Cadiuéios Indians, Paragua river, southern Brazil, grass bags (A).

Outside of America the Peabody Museum shows examples of twined weaving from the Swiss lakes (style A), Egyptian graves (A), central Africa (A), China (A and B), Japan (A), Ainos of Japan (A), New Zealand (A), Australia (A), Marshall islands (B), and the Society islands (A and B).

It is also interesting to note the survival of the simplest form of this weaving in various objects of everyday use—our ordinary wicker wastepaper baskets and crates for shipping crockery and similar material serving as examples.

C. C. WILLOUGHBY.

A Correction.—On page 773, volume II, of this journal I use the language, "In my limited study no twined weaving was ever done in America south of the present boundary of the United States." The absence of this technic from more than half of the Western Hemisphere is indeed surprising, but since writing the sentence at the head of this paragraph I have found drawings of twined basketry from Peruvian graves in the *Eleventh Annual Report* of the Peabody Museum, pp. 280, 291, 292. One of the drawings shows the style of crossed warp such as one sees in cedar-bark baskets on the coast of British Columbia.

O. T. MASON.

Artifacts from Norse Ruins. — I regret the necessity of calling attention to the unfortunate error that has crept into the article by Mr Gerard Fowke on "Points of Difference between Norse Remains and Indian Works most Closely Resembling them," published in vol. II, No. 3, of this journal. On page 562, speaking of the "lack of the slightest trace of bone or any object which shows the least indication of" the artificiality of the "Norse graves" at Clematis Brook, near Cambridge, Mr Fowke says: "The same statement is true in regard to the graves of Iceland and Greenland, and not only of the graves in these countries, but also of the house sites." The author has evidently overlooked even Miss Horsford's statements in the article which he cites (*National Geographic Magazine*, March, 1898, p. 81), not to mention the sources from which that information is drawn (V. Boye, "Beskrivelse af og Fortegnelse over de ved Premier-lieutenant D. Brunn i Nordboruinerne fremgravede Oldsager," *Meddelelser om Grønland*, 16de Hefte, and G. F. Holm, " Beskrivelse af Ruiner i Julianehaabs Distrikt, pp. 119, 136, etc., ibid., 6te Hefte).

I quote from Miss Horsford's "Dwellings of the Saga-time": " Numerous relics have been found in these ruins [of Greenland]—iron nails and knives, pieces of stone vessels, spinning stones, bone combs, and stone pendants, bored with holes and incised with runelike but illegible characters." The following is from the résumé of Lieutenant Holm's work, p. 211 : " In the cemetery of Kagsiarsuk, in the Igeliko fjord, lay at a slight depth many bodies, placed quite near together under great stones, as if in a family tomb. These bodies, of which the heads were turned toward the west, seemed not to have been extended, but folded upon themselves, and there was no trace of coffin or grave-clothes. At Ikigaet, on the contrary, where bodies have been found interred at greater depth, they were lying in caskets joined with wooden pegs but without cover, and clothed in sheets of brown woolen stuff. The coffins contained also little crosses of carved wood." Such graves do not present the same type as the hypothetical ruins of Massachusetts. Now, when even Longfellow's famous "Skeleton in Armor" seems to have spoken an Algonquian tongue, it were well to move cautiously. The question of the long occupancy of the New England coast by the Northmen is, I believe, still an open one, and ground is lost rather than gained by a slip like the one in question.

H. NEWELL WARDLE.

Academy of Natural Sciences, Philadelphia.

With Miss Wardle's permission her communication was referred to Mr Fowke, who responded as follows :

" The article to which Miss Wardle refers was written soon after the excavations were made at Cambridge. It was considerably changed from its original form when sent to the *Anthropologist*, hence is not so clear on some points, perhaps, as it should be.

" My information in regard to Norse remains, except about Cambridge, is entirely second-hand. In speaking of graves elsewhere, I had in mind only the small circular cairns. Having been told that no remains occurred on the hut-sites in Greenland, I took it for granted—'jumped to the conclusion,' perhaps,—that specimens found there, as mentioned in the *National Geographic Magazine* and enumerated by Miss Wardle, were left by people occupying the site at a date later than Lief's time; that such was the meaning of the words 'attributed by the Danes to a period later than the Saga time.' Thanks for the correction."

GERARD FOWKE.

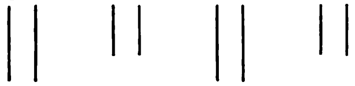
"The Skeleton in Armor"; was it Norse or Indian?— With many people Longfellow's poem, with its prefatory note of "a skeleton clad in broken and corroded armor," has been held as proof indubitable of the presence of the Norsemen in New England. The word armor brings up visions of breastplates and bucklers, visors and helmets, with all the protective paraphernalia of the martial men of the middle ages; then, too, metallic armor was unknown among the New England Indians.

In the winter of 1897 it was my good fortune to hear Mrs Julia Ward Howe give one of her delightful parlor lectures on her personal recollections of Longfellow, Whittier, Lowell, and Emerson, in which she told of the circumstances which led to Longfellow's writing of the poem in question. At that time Mrs Howe's family were living in Newport; her brother, Mr Sam Ward, and Mr Longfellow were intimate friends, and the poet often visited at their home. On one occasion Mr Ward called the poet's attention to a recent interesting discovery of a skeleton with brass tubes upon its chest which was preserved in a private museum at Fall River, suggesting it as a fine subject for a poem. While on his return journey to Boston Mr Longfellow visited the Fall River museum and the poem of "The Skeleton in Armor" was the result. Soon after his visit the museum and all of its contents were destroyed by fire.

The description of the armor as having been composed of "brass tubes" was highly suggestive to me. A few days later I wrote to Mrs Howe, enclosing an extract from an early writer on New England, asking if it described the so-called armor. The quotation was to this effect: "An Indian with a bandolier of copper tubes upon his chest, and another about his middle, will strut about thinking himself the equal of King Charles." There are many allusions in early writings to copper tubes strung upon sinew or fiber and worn as a highly-valued ornament by the Indians.

Mrs Howe's reply settles the question of Norse armor or Indian ornament. It is as follows:

> "My dear Mrs Eaton:
>
> "You must remember that it is about sixty years since I saw the *skeleton* at Fall River. I think, however, that what was called its armor corresponded very much to the description quoted in your letter. It was composed of hollow pieces of metal, like reeds, of various lengths. The color led me to suppose that this metal was brass. I remember it as of a light yellow color. The pieces seemed to be strung on a fiber of some sort, hanging something in this way:



but closer together, one set of these being on the breast, the other across the abdomen, the figure in a kneeling or crouching posture.

"Wishing that I could tell you more about it, believe me

"Yours sincerely,

"JULIA WARD HOWE.

"*Boston, May 10th, 1897.*"

The method of burial in a "crouching posture" is also an evidence of the skeleton having walked the earth as an Algonquian Indian.

Much can be allowed to "poetic license," but, when poems are quoted as proof of historic facts, it is well to investigate the data upon which they are founded. In this case Mrs Howe's recollections seem to have settled the question.

HARRIET PHILLIPS EATON.

Death of Colonel Hilder.—Frank Frederick Hilder was born in Hastings, England, in 1836 ; he died in Washington, January 31, 1901. After a course at Rugby young Hilder entered the military school at Sandhurst, whence he was graduated. Entering the British army as a cornet, he was sent to India where, through conspicuous gallantry, he was awarded the Mutiny medal, with special service bars for Delhi and Lucknow. While thus engaged in the military service his attention was directed to the manners and customs of the inhabitants, first in India, later in Borneo, Egypt, the Philippines, and elsewhere in the Old World. His skill as a military expert attracted the attention of the Khedive who appointed him a colonel in the Egyptian army.

While serving in this capacity Colonel Hilder's sight was seriously impaired ; this led to his resignation, and coming to America during the Civil War, he rendered notable service for the Engineer Corps. For many years after the Rebellion he engaged in business which led him again to many parts of the world, particularly to South America, where he visited almost every civilized settlement and many that were not civilized. Settling at St Louis after 1871, he became interested in the mounds of the Mississippi valley, and the collections obtained through personal excavations (some of which are now in the National Museum) are noteworthy for their representative character and for the intelligent manner in which they are catalogued. By reason of his intimate knowledge of the Spanish language, Colonel Hilder rendered valuable service to the Bureau of American Republics in its early days ; later he contributed articles on education in South America to the reports of the Commissioner of Education, and in 1899 became ethnologic translator in the Bureau of American Ethnology, which position he held at the time of his death. During the winter of 1899–1900 Colonel Hilder visited the Philippines under the auspices of the United States Commission for the Pan-American Exposition, making a valuable collection of ethnologic and other objects for exhibition at Buffalo. On his return to Washington he continued to completion the translation of a manuscript history of Texas—prepared anonymously but attributed by Colonel Hilder to Fray Agustin Morfi in the latter part of the seventeenth century—and had begun its annotation when overcome by his final brief illness.

Ever courteous and generous, endowed with learning of that substantial sort which comes with long and intimate acquaintance with the wide world, Colonel Hilder made many friends who courted his companionship for their personal gain in knowledge and for the ennobling influence of a good man. F. W. H.

Jipijapa or Panama Hats.—Ecuador is the real home of the hats wrongly designated under the name of "panama," and according to the *Recueil Consulaire Belge* this industry afterward extended to Peru and other countries, even to Yucatan in Mexico. Everywhere in Latin America the hat is known under the name of *jipijapa*, in honor of the city where its manufacture was first started. It is only in Europe or outside of the producing countries that this hat receives the name of a city which does not make it. The finest hats are made in Jipijapa and at Montecristi, in the province of Manabi, Ecuador, this industry being one of the greatest resources of the country. The *toquilla*, or leaf of a small plant, is used for this purpose. It grows abundantly in the country, the leaves coming up in the shape of a fan. The plant is the *Carludovica palmata*. There are jipijapas of all qualities, from those costing a few pence to those worth several pounds. The merit of these last, really marvels of fineness, consists as much in the scarcity of the straw as in the difficulty of the weaving, and therefore it is exceptional to find these hats on the general market. The hats of current sale cost a few shillings, the finest not exceeding from five to six pounds sterling in price. In buying a panama it is necessary to ascertain two things—that the straw is whole and that it is not stiffened. It is not easy to recognize this first condition. In order to make two from one, the weavers split the straw with such perfection that unless a person is accustomed to such examinations it is almost impossible for him to distinguish the difference. Of equal fineness the hat made from whole straw is worth three or four times the one manufactured from the straw that has been split. The second condition is easily recognized, for the hats are stiffened to make the straw firmer and white. Good toquilla is white and stiff enough not to need any gum, and only ordinary panamas are stiffened.—*Journal of the Society of Arts*, London, August, 1900, p. 744.

Twine-making without Apparatus. — An observant lady friend, who had been traveling in southeastern Alaska, gave me the following description of two-ply twine-making by a Tlinkit woman: "All the fingers on both hands are used in the operation. In beginning, a small bundle of filaments is doubled and the middle loop grasped between the thumb and forefinger of the left hand. The two ends are brought downward on the palm and held in place by the fourth and fifth fingers. One of the ends is then seized between the thumb and the first two fingers of the right hand and twisted several times. This end is then brought down upon the palm of the left hand and held in place by the fourth and fifth fingers, so that it cannot untwist. At the same time the other end is taken up by the fourth and fifth fingers of the right hand and passed over to the thumb and forefinger of the right hand, when the operation of twisting is repeated, first one strand and then the other. The two ends are then grasped with the fingers of the right hand and twined two or three times, and at the same time the thumb and forefinger of the left hand help in the twisting. Seizing the band or loop in the right hand, it is drawn forward so as to take up the finished part of the twine. Fresh filaments are added, and the operation goes on as long as necessary, the completed twine being wound into a ball."

In the *Fourteenth Annual Report* of the Bureau of Ethnology, Dr Hoffman describes quite similar twine-making, by the Menomini, from the inner bark of young lindens. In this example, however, the two ends are held on the thigh, near each other, and twisted simultaneously with the palm of the hand, while the looped end is held between the thumb and forefinger of the left hand. These fingers also aid the twisting.

Otis T. Mason.

Study of the Romance Languages and Literature, especially of the earlier periods, will receive a powerful impetus through a society recently formed in Europe, with Prof. Dr W. Foerster, of Bonn University, as president. The society will engage in editing and publishing early manuscripts and in reëditing and printing early classics that have become practically inaccessible through their extreme rarity. The works of the authors who wrote in old French before and after the thirteenth century, the Italians of the period of Dante, Tasso, and Ariosto, the Spanish dramatists, and the leading contributors to Portuguese and Provençal literature, as well as those of the seventeenth and and eighteenth centuries will be reproduced. The great obstacle in such a study—the scarcity of the most important ancient poems, dramas, and collections of popular songs—will largely be surmounted through the coöperation of such scholars as K. Vollmöller of Dresden, G. Baist of Freiburg, F. A. Coelho of Lisbon, R. M. Pidal of Madrid, A. Morel-Fatio of Paris, and a score of others. Among the first of the literary monuments to be reproduced is the "Search for the Holy Grail" (*A demanda do santo Graal e a morte del rrey Artur*), the oldest known Portuguese prose classic; this will be followed by five Italian comedies dating from 1524 to 1537, and three Spanish comedies of 1550–51; the recently discovered *Tercera parte de la Silva de Varios Romances*, 1551; the *Cancionero de Constantina*, a rhymed chronicle of the Cid, the comedies of Lope de Vegas reproduced from the original of 1604–47, and many others. The publications of the society will be distributed by its treasurer, Fr. Junge, of Erlangen, Germany.

A. S. GATSCHET.

Miles Rock, one of the founders of the Anthropological Society of Washington, died at Guatemala City, Guatemala, February 1st. Mr Rock was born in Ephrata, Pennsylvania, October 10, 1840. He attended the local school and the Lancaster High School, and was a student of Franklin and Marshall College until the outbreak of the Civil War. After serving throughout the war, he entered Lehigh University, whence he was graduated in 1868 as a civil engineer, and in which he taught mathematics and mineralogy during the year 1868–69. In 1870 he went to Cordova, Argentina, as astronomical assistant in the observatory, and during the next three years was engaged in mapping the stars of the southern heavens. From 1874 to 1877 he was attached to the United States Hydrographic Office; in 1878 was an assistant on the Wheeler Survey, and from 1879 to 1883 was an assistant astronomer of the United States Naval Observatory. From 1883 to 1898 Mr Rock was the head of the Guatemala Commission to determine the Mexico-Guatemala boundary, and his faithful and intelligent labors in this direction were so highly appreciated by the Guatemalan government that at the time of his death it took charge of his remains, and unusual public honors were bestowed at the time of his funeral, which was directed personally by President Cabrera. During the early years of the Anthropological Society of Washington Mr Rock manifested deep interest in its welfare. At its sixth meeting, held May 20, 1879, he read a paper on "Indian Pictographs in New Mexico," and late in the same year he presented a memoir "On the Effacing Power of Tropical Forest-growth in Trinidad Island."

Conscious Word-making by the Hupa.—The Hupa Indians of northern California have a custom which compels them to form new words and to discard the old ones. After a burial ceremony is completed it is a serious offense to utter the name of the deceased in the hearing of a relative. It often happens that the name is that of some common animal or object, when a new designation must be invented, at least for use in the presence of the relatives of the deceased. If the new name happens to "take," or the person who had been called by the old one was prominent in the tribe, the change will be likely to be permanent.

Three instances of this have come to my notice. The old word for wild goose was *h'ā*. An important man known by that name having died some years ago, the word has largely gone out of use. The young people know only *tlĕ-kŭnch-yĕ-dĕ-tĭ'-lĕ*, "the one that likes salt." Nearly all the Indians say *mitl-kĕ-ō-hat*, "what one buys with," to avoid *nă-dĕ-au*, the older word for money. A woman having lost a relative who bore the name *djō-kjō*, "grouse," employs the poetical expression *wĭt-wăt-yĕtl-tchwĕ*, "the flour-maker," from the similarity of the sound of a grouse's drumming and the noise made in pounding acorns. This process of word-building in the course of a few centuries may have largely changed the nouns of the language.

Pliny E. Goddard.

Cushing's Zuñi Folk-Tales.— A committee consisting of Major J. W. Powell, Miss Alice C. Fletcher, Dr Franz Boas, Mr Stewart Culin, Dr George A. Dorsey, and Professor W. H. Holmes, with Mr F. W. Hodge as secretary, is planning to have published, by a prominent New York house, a handsome, illustrated volume containing more than thirty folk-tales which were recorded and translated by the late Frank Hamilton Cushing during his long and intimate association with the Zuñi Indians of New Mexico. The printing of the volume will be begun as soon as advance orders sufficient in number to guarantee the cost of production have been received. As there is little likelihood that the volume will be reprinted, those who desire a copy should communicate immediately with the Secretary of the committee, at Washington, D. C. The subscription price has been fixed at $3.50, payable on delivery of the book.

Eskimo Stone Implements.—Rev. H. R. Marsh, formerly a Presbyterian missionary at Point Barrow, Alaska, but now at Joliet, Illinois, informs me that around Point Barrow, among the Eskimo, stone is called *o-ya'-hak*, jade is *ĭs-ig'-nak*, and flint is *añ-mak*; hammer is *kaw-tak*, adze is *u-li-maw*. The stone adze or the flint of the woman's skin-scraper is called *ku-kia*. No matter what the material, if put to the same use, the same word is employed: that is, an adze might be of nephrite, flint, or any other stone, but its name would invariably be *ku-kia*. An adze handle is called *ka-te-lo'-a*, an ax or hammer handle is *i-po-a*, a pail handle is *ne-go'-me-o-ta*. THOMAS WILSON.

BY THE WILL of the late Professor Edward Elbridge Salisbury, Yale University will receive on the death of Mrs Salisbury a certain part of the residue of the estate, the amount being estimated at $150,000. One-half of the sum is to provide an additional income for the Salisbury professorship of Sanskrit and comparative philology, and the other half is to accumulate until it reaches $100,000, when the income is to be used for such purpose as the trustees may determine.—*Science.*

ANTHROPOLOGY AT HAVANA.—The dean of the faculty of science and arts of the University of Havana has assigned the chair of anthropology to Dr Louis Montané, a disciple of Quatrefages and Hamy and a pupil of Broca. It is said that Dr Montané is completing the preparation of a work which has for its object the description of skulls of Indians of Cuba which he discovered at Baracoa and Guantanamo, in the province of Santiago.

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE has granted £10 for excavations at Silchester, £30 toward the archeological survey of Canada, the balance (amounting to £10) of a previous appropriation for the purchase of photographs of anthropologic interest, £5 toward anthropological teaching, £145 for explorations in Crete, and the balance in hand under a former appropriation for determining the age of stone circles.

MICMAC-ENGLISH DICTIONARY.—Of the Micmac Dictionary prepared by Rev. Silas Tertius Rand, who died in 1889, only the English-Micmac volume was published (Halifax, 1888, 4°). The Canadian government has now planned to publish the Micmac-English part under the editorship of Mr J. S. Clark, of Bay View, Prince Edward Island.

A "BIBLIOGRAPHY OF CHILD STUDY FOR THE YEAR 1899," by Louis N. Wilson, of Clark University, has been reprinted from vol. 7, pp. 526–556, of the *Pedagogical Seminary*. The Bibliography comprises 441 titles and a subject index.

THE UNIVERSITY OF CAMBRIDGE, England, has accepted a collection of ethnological specimens formed in the Maldine islands by Mr J. Stanley Gardiner. The collection will be deposited in the Museum of Ethnology.

THE DEATH of Dr Hippolyte-Jean Gosse, professor of legal medicine at the University of Geneva, and Director of the Archeological Museum of Geneva, on February 22d, in his 67th year, has been announced.

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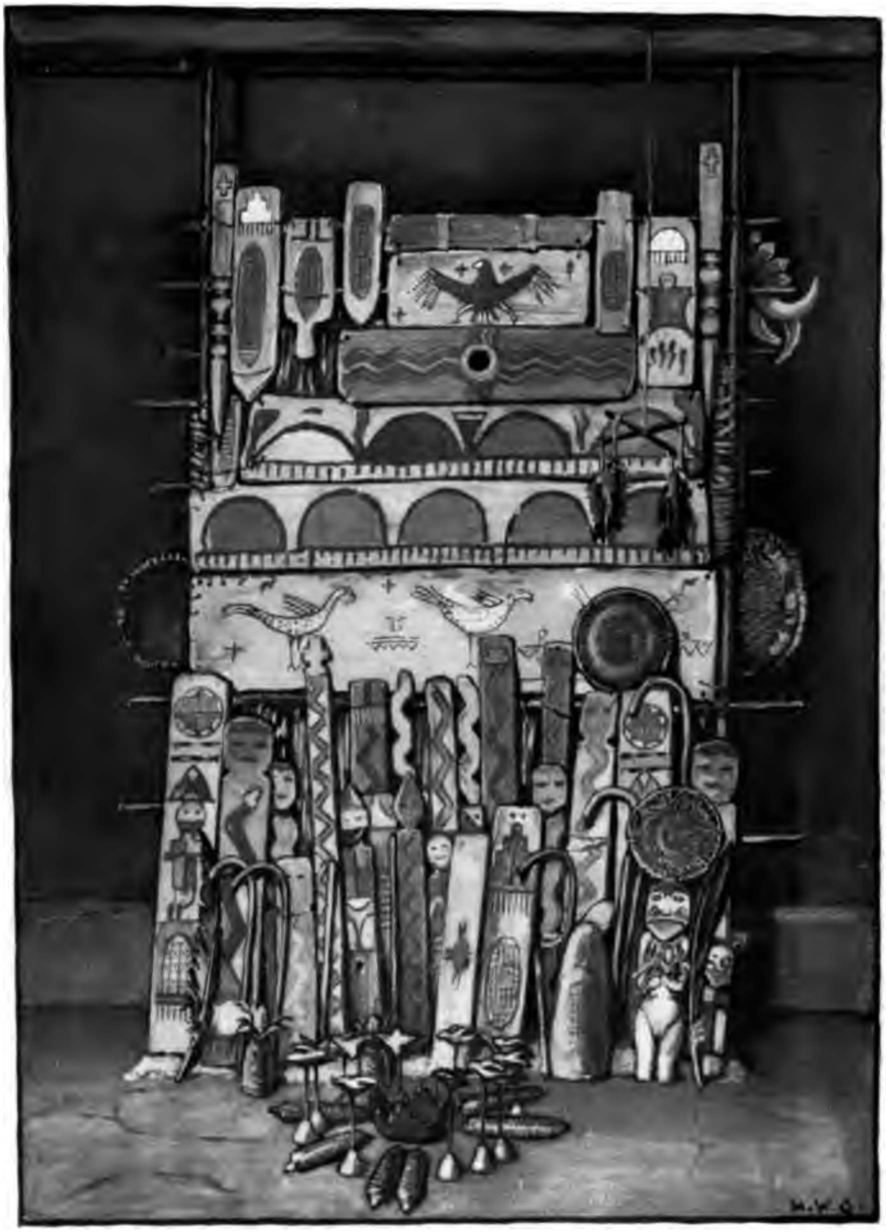

OWAKÛLTI ALTAR AT SICHOMOVI

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THE OWAKÜLTI ALTAR AT SICHOMOVI PUEBLO

By J. WALTER FEWKES

INTRODUCTION [1]

Each Hopi clan possesses one or more ancient objects, called ***wími***, which it has inherited from the past and regards with special reverence. The clan ownership of these objects dates back to a time when cultural and sociological conditions were somewhat different from those of the present.

These *wími* are generally supposed to be endowed with occult powers, and the way in which they are regarded may well be likened to that in which, according to Spencer and Gillen, the Central Australians consider sacred objects called *churinga*. They are thought to possess magical powers by the use of which the priests can obtain certain results, are almost universally totemic, and are intimately connected with the ancients, the worship of whom runs through all Hopi ritual.

In old times, when the clans lived apart, the worship of the *wími* was limited to the clans which owned them. When clans combined, their *wími* passed into the custody of priest fraternities and were thus reverenced by several clans, but ownership of the objects still remained with the original clans. After this union the clan head-man or head-woman became the chief of the fraternity. He then held the clan *wími* on account of his position as chief of the society.

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[1] This article is published by permission of the Bureau of American Ethnology, under the auspices of which the material for it was collected.

When required for divination or for medicinal or magical practices, in early times, these objects were used in the presence of the clan, or, we may say, were exhibited to clan members at those times; later, when a religious society formed from several consolidated clans came into being and the number of these *wími* increased, it became necessary in this exhibition to install them with a certain prescribed arrangement. Such an installation is called a *poñya*, or altar, and on the occasion of its erection there is held a festival or ceremony which is greater or lesser, elaborate or abbreviated, according to the time of the year or other circumstances.[1]

The study of these collections of sacred objects or altars has attracted the attention of several ethnologists, and progress has been made in the interpretation of their significance. The first known representation of a Hopi altar was an unpublished painting made under direction of Maj. J. W. Powell, about twenty-five years ago. Captain Bourke, in his book on the Snake dance, published in 1884 the first figures of a Tusayan sand picture, and the Hopi Antelope altar was figured by Stephen in 1887. In the decade 1890–1900, the author described and illustrated several altars, obtaining in 1891 the first photograph ever made of these sacred objects. A model of a Hopi altar which showed the sand pictures only, was exhibited by the author at Madrid, Spain, in 1892–'93, and in 1895 he made a complete representation of a *Lalakoñti* altar for the National Museum at Washington, where it is now on exhibition.[1] One of the first Pueblo altars modeled for exhibition purposes was made by the late F. H. Cushing, who prepared a group of Zuñi figures and an imitation of a Zuñi sand picture for the World's Columbian Exhibition at Chicago; this also is now in the National Museum. Mrs M. C. Stevenson, in 1898, made a model of an altar of the Zuñi War-god which now forms an instructive exhibit in the same institution. Several Oraibi altars were reproduced during 1900 under direction of the Rev. H. R. Voth, for the Field Columbian Museum, and photographs of certain of these have appeared in a late report of that museum.

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[1] Every fraternity or religious society at Walpi has its greater and lesser mysteries occurring commonly six months apart. There are also elaborated and abbreviated festivals in different years, the celebration of the former occurring quadrennially. In the lesser mysteries only a part of the altar is ordinarily installed, but in the greater all the *wími* are placed in position.

Notwithstanding the enlarged knowledge of these objects which the above references to the subject implies, there still remain several Hopi altars which have never been figured, modeled, or described. One of the most instructive of these is that of the *Owakülti*, a ceremony at Sichomovi,[2] in some respects the most suggestive of all Tusayan religious performances. As the *Owakülti* festival is celebrated only occasionally in this pueblo, it has seemed timely to publish these notes lest an opportunity to enlarge them might not occur.

THE SICHOMOVI OWAKÜLTI ALTAR

The *wími* composing the *Owakülti* altar of Sichomovi may be considered under two groups, viz., those arranged on the floor of the room where the altar is placed, and those forming the uprights attached to a vertical framework erected for them in the kiva. Our account will first consider the former group, including the following objects: 1. Tiponis; 2. Effigies (idols); 3. Medicine-bowl and surrounding objects.

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[1] The author hoped at one time to have the means and space to erect in the National Museum a complete series of Walpi altars. The death of his friend, Dr G. Brown Goode, who manifested deep interest in the plan, led to its abandonment.

[2] The author has extensive notes, sketches, and a few kodak photographs of the Oraibi *Owakülti* altar, which is one of those modeled for the Field Columbian Museum.

1. *Tiponis*.—The badge of the religious fraternity among the Hopi is called a *tiponi;* this was originally the palladium of the clan, and as the fraternity is made up of several clans there are ordinarily several of these objects on every altar. The *Owakülti* altar has two *tiponis*, one belonging to the chief of the *Buli* or Butterfly, the other to the *Pakab* or Reed clan. These two clans form the nuclei of the *Owakülti* society. A *tiponi* is regarded as the most important of all altar *wími*, and is ordinarily called "mother"; but it is totemic only so far as it is a symbol of food or seed, the potential sustenance of an agricultural people, and is generally an ear of corn with appropriate wrappings and feathers. When we consider its status in the Hopi cultural life—how it came through symbolism to be elevated to the highest place in their reverence—corn is mother in the sense of furnishing sustenance to people who rely upon it for food, and is so highly prized that its seed was committed to the care of the chief of the clan. Every Hopi child has a similar ear of corn as its special symbolic "mother"; every youth initiated into a religious fraternity has a like symbol of his food mother. Each novice at initiation places his special ear of corn on the altar at the time of his induction into the society; but the ear of corn with accompanying trappings owned by the chief of the clan is the only one ordinarily called the *tiponi*,[1] although in essential symbolism it is the same as that owned by each and every individual.

2. *Effigies* (*idols*).—Although apparently very complicated, Hopi mythology in reality is simple, as most of the names of the gods are attributal. Especially is this true of the Sky- and Earth-gods, the names of which are numerous and perplexing. It would, in fact, seem that every clan had its own name for each of these gods, and it is this multiplicity of names which makes a proper identification very difficult. Every clan had a great Sky-god and an Earth-god or -goddess, the former being the father, the latter

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[1] The *tiponi* was originally a reserve ear of seed-corn kept with reverential care as a last resort if all other seed failed.

the mother of all minor gods. Each clan also had its totemic ancestral members—the ancients, male and female,—resembling each other in type but not in name. Three supernaturals, differing in name and in personation, appear in connection with most Hopi altars. These three are (*a*) Sky-god, (*b*) Earth-god, and (*c*) Cultus hero or heroine. They are personated symbolically and may be represented by a human being, a graven image, or a picture, or by all these combined.

The idols on the Hopi altars are both male and female, and their forms and names vary with different altars. In the *Owakülti* the three idols are as follows: A male effigy represents *Cotokinuñwû*, the Sky-heart, a Sun- or Sky-god who wields lightning ordinarily associated with him as a symbol. One of the two other idols represents the Growth-god, *Müyinwû;* the other *Owakül-mana*, the special tutelary ancient or ancestress of the clans from whom arose the *Owakül* society. *Müyinwû* is represented by a half-ovoid block of wood upon the sides of which symbols of corn are painted. The image of *Owakül-mana* is rudely human in form.

3. *Medicine-bowl and Surrounding Objects.* — On the floor directly in front of the upright part of the altar is placed a medicine-bowl, around which are radially arranged certain objects yet to be mentioned. This bowl, as usual, is placed on a low pile of sand, upon which are drawn six radiating lines of sacred meal representing the six directions—north, west, south, east, above, and below. On each of these lines of meal is an ear of corn of the color corresponding to the direction with which it is associated in the Hopi cult, viz., north, yellow; west, blue or green; south, red; east, white; above, black; below, speckled.

Alternating with these ears of corn are effigies of birds and butterflies mounted on slender pedestals held in clay bases. Their colors likewise correspond with those ascribed to the cardinal points which they represent. The following names were obtained for birds and butterflies corresponding to the six world-quarters:

North, *Tawa-mana.*
" *Sikyaboli* (Yellow butterfly).
West, *Tcosro.*
" *Cakwaboli* (Blue butterfly).
South, *Muʻzrin-mana.*
" *Palaboli* (Red butterfly).
East, *Poyabi.*
" *Pociwû.*
" *Kütcaboli* (White butterfly).
Above, *Topocka.*
" *Kumbiboli* (Black butterfly).
Below, *Tawaktci.*
" *Neyanumboli* (Variegated butterfly).

Each of these birds, or butterflies, has a small twig on its back which had been sprinkled with sacred meal. There is a trilobite (said to be an " old butterfly ") on the floor near the bowl. Certain other objects lay near the altar, among which may be mentioned a tray of sacred meal, a corn-husk containing corn-pollen, several water-worn stones, pipes, and a bag of tobacco. All of these are used in the rites which occur when medicine is made.

Upright Parts of the Altar.—Hopi altars as a rule have, in addition to the graven images, the medicine-bowl, and surrounding objects, a number of wooden slats and clay tiles or flat stones with symbols painted upon them. In the *Owakülti* altar these wooden slats are tied either vertically or horizontally to a framework attached to the beams of the kiva. Their sizes and forms vary; most of them are rectangular, while a few have a rude head cut on one end. The designs painted on the slats may thus be classified: *a*, Symbols of maize; *b*, Symbols of lightning; *c*, Pictures of birds and insects; *d*, Pictures of sun and cultus heroes; *e*, Figures of rain-clouds.

The first group (*a*) includes not only symbolic pictures of corn but also pictures of the Growth-god. The members of the second group (*b*), the number of individuals in which is far greater than in the first, have ordinarily a zigzag shape, bearing, when rectangular, zigzag figures often replaced by designs representing snakes. The symbol of lightning is a picture of a snake which is conventionalized into a zigzag figure representing the course of the lightning in the sky and the movement of the serpent, a similarity which has been recognized by most primitive peoples and introduced into their symbolism.

All the lower tier of wooden slats are arranged standing upright in a ridge of sand on the floor, but leaning on the framework of the altar. Above them is a broad, horizontally placed board bearing symbolic bird designs the figures of which (plate IV) convey a better idea than a mere verbal description. Above the board with the pictures of these three birds there is another, also horizontal, resting upon the last-mentioned. It is tied to the altar framework at each end, and is decorated with a row of five semicircular designs symbolic of rain-clouds, from which depend short parallel lines representing falling rain.

Above the last-mentioned board and parallel with it, also horizontally placed and tied at each end to the uprights of the altar, is another board bearing a row of semicircular figures representing clouds. From these symbols also depend parallel lines, symbolizing falling rain. These cloud symbols are painted yellow, green, red, and white, thus corresponding with the four cardinal points, north, west, south, and east, respectively. The triangular symbol between two of these clouds is the conventional figure of a feather, while the indistinct zigzag markings between others represent either feathers poorly drawn, or, more likely, the lightning.

Just above the row of upright wooden sticks there is a broad slat, tied horizontally to the altar framework, upon which are depicted three birds, dragon-flies, and star symbols. The uppermost horizontal slat is not decorated, but its surface is crossed transversely by a number of elevations. This slat is known as *tokpela*, the "rain-cloud house" or "high-sky house"—practically the heavens. Attention is called to the relative position of the slat to that on which the bird and stars are painted and to certain designs on ancient Tusayan pottery.

Bands, to which are appended highly conventionalized bird symbols, are often drawn across the interior of many old food-bowls from Sikyatki. These bands are accompanied with figures of stars, and from them hang conventionalized devices representing birds. The interpretation of this band has not been satisfactorily made, but light is shed on its significance by a study of this altar. If we compare this band with the horizontal wooden slat last mentioned, we find both associated with similar conventional designs, and it is probable that both express the same idea. The diametrical band on the pottery may thus be interpreted to represent the sky band, or home of a sky-bird, which may be the symbol of a sky-god.[1]

Several smaller wooden slats, attached to the uprights of the altar, and which likewise serve as symbolic pictures, remain to be mentioned. One of these has a rain-cloud, a frog, and tadpoles painted upon it. Two round sticks, resembling certain prayer-sticks found in Sikyatki graves, have crosses painted on their flat faces, from which fact they are called *tokpela*, "high-sky" symbols. There was also another object, called by the same name, hanging before the altar from the roof. It consists of two sticks tied in the form of a cross and has turkey-feathers attached to the arms.

Less conspicuous than the objects above mentioned, but of greater importance in the public dance, are two netted hoops hanging above the idol of the *Owakülti* maid. These were later carried by the girls who personated this maid in the Basket dance on the last day of the festival.

Reviewing what has been written above, it is clear that a study of the *wími* of this altar reveals a general homology, from a point of view of symbolism, with other Tusayan altars. The same rain-clouds, lightning, and maize symbols are prominent and apparently have the same intent. The images are tutelary clan ancients having distinctive names but with few differences in general character. It shares with other altars Sun- and Germ-god pictures, but the chief idol, *Owakül-mana*, is characteristic.

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[1] Compare figures of this band in *Seventeenth Ann. Rept. Bureau of Amer. Ethnology*, plates CXXXIX, CXLVI*d*, CXVII*f*, *et al.*

I have described the altar as it appears on the second day (*Luctala*) before the prayer offerings, called *pahos*, had been set up before it. These objects are characteristic, consisting of a small wooden slat upon which an ear of corn is depicted and to which feathers, herbs, and a small package of meal are attached. A description of these is reserved for a more extended account of the ceremony.

THE OWAKÜLTI FESTIVAL

Like all other festivals[1] in the Hopi calendar, there are two presentations of this ceremony annually—one abbreviated, the other elaborate,—occurring about six months apart. The latter is occasionally celebrated at Sichomovi in October and lasts nine consecutive days and nights, closing with a public Basket dance. The date of the festival is determined during a nocturnal smoke-talk of the chiefs, sixteen days before the public event, and is formally announced by the town-crier on the following morning. The nomenclature of the nine ceremonial days of *Owakülti* is similar to that of other great unabbreviated festivals elsewhere described. It is not within the scope of this article to describe the many and complicated rites before the altar on the successive nine days and nights composing the festival, but these have been carefully noted and will later be published in an appropriate place. A brief reference to the "making of the medicine" on the assembly day sheds light on the meaning of some of the *wimi*.

Making the Medicine.—Six women (of whom four were priestesses) and four men took their position about the medicine-bowl on the assembly day, and arranged about it the different objects already mentioned. While the chiefs were arranging these objects, a woman made the circuit of the room, drawing on each of the four walls and the ceiling four parallel lines. This is called "making the house," and occurs in various other ceremonies. The objects having been satisfactorily arranged about the bowl, not without considerable discussion regarding their places, one of the women, called the smoker chief, lit a pipe which she handed to the chief, exchanging terms of relationship. The chief puffed whiffs of smoke to the six cardinal points, then handed the pipe to her nearest neighbor. After all had smoked, and the pipe had been returned to the lighter, all present prayed in sequence, beginning with the chief. These prayers finished, the songs began, and during the first song several butterfly wings were dropped in the bowl with pinches of pollen—one for each of the six directions—a prescribed (sinistral) circuit. As the person added the object he raised his hand to the cardinal point for which the offering was intended. Later, near the end of the song, the fragments of herbs on the heads of the wooden effigies of birds and butterflies were dropped into the medicine-bowl, the images being raised in sequence for that purpose.

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[1] Every great festival has a summer and winter or spring and autumn celebration, one of which (the greater) being elaborate, the other (or lesser) abbreviated.

During the second song, water was poured into the medicine-bowl from each of its four sides and the two opposite corners, beginning with the northern side; at each addition the gourd receptacle containing the liquid was raised to its respective cardinal point.

During the third song the six ears of corn which lay on the floor, radiating from the medicine-bowl, were gathered into a bundle and placed in a vertical position in the bowl, so that one end was submerged. One of the men then leaned forward and grasped this bundle, swaying it back and forth in time with the song. At the close of the singing he carefully took each ear of corn separately from the bundle, asperged with it to the six points in sequence, and laid it in its former position on the line of meal radiating from the medicine-bowl. At the fourth song a man knelt by the bowl and whistled several times through a turkey-bone whistle into the liquid. This act was performed six times, each time the performer prefacing his act by sprinkling a pinch of corn-pollen along an ear of corn corresponding in position to a cardinal point.

The same man then stirred the medicine with an ear of corn, while the others sang a new song, at the close of which the pipe-lighter lit the pipe, and the chief, kneeling over the bowl, puffed great clouds of smoke into the medicine, after which he returned the pipe to the smoker chief.[1]

All the men and women then drew together, forming a close ring about the bowl, each taking a bird effigy or butterfly image in his hands. As the song continued, each person moved the effigy he carried in a zigzag course toward the bowl, and finally plunged its head into the liquid. This was repeated several times, after which the pedestals that supported the effigies were returned to their former positions. One of the women added a little sand to the liquid, and the trilobite, or "ancient butterfly," was dropped into the bowl; a man taking meal from a tray daubed a little on the cheek of the idol of *Owakül-mana* lying on the floor, and, passing to each person in the kiva, rubbed meal on his face. Before the meal was used, a ray of sunlight was reflected into it from a quartz crystal. This is also done with pollen, the male prayer emblem.

The songs then ceased; the pipe was lighted, every person smoked in sequence, and later prayed, which was a final act in making the medicine. This ceremony was repeated several times with minor variations during the following days of the festival, and was followed by a feast.

Such in brief are the main episodes in the making of the *Owakülti* medicine. A few characteristic points in it may be emphasized:

(1) Butterfly symbols are prominent throughout. The effigies of butterflies, wings of the same insect, even a trilobite,—called the "ancient butterfly,"—are introduced in this ceremony, and, it

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[1] This is probably the episode figured in Major Powell's painting, above referred to.

may be added, in no other. Several chiefs who perform the rites are members of the Butterfly clan. Here, then, we have all the elements of butterfly totemic worship. But what does it mean? Can we not find an explanation by comparisons with the aspect of totemism brought to light by Spencer and Gillen's epoch-making work on the ethnology of the Central Australian tribes?

Theoretically we may suppose that the Butterfly clan has certain powers increasing their totem animal, not for food but by sympathetic magic to hasten the advent of that season of the year longed for by agriculturists. Cause and effect are confused in the mind of primitive man. With butterflies come summer time, with the frog comes water,—and these associations are confounded into cause and effect. The priest with power to bring the animal brings also the climatic condition accompanying its advent. The Butterfly clan has special power over the butterfly, which it uses for the good of the tribe. The use of these butterfly symbols thus becomes a form of gesture-prayer or sympathetic magic of great potency in hastening the advent of summer.

(2) Whistling into the medicine is in the same way a means of bringing summer birds, and originated in the same psychologic process as the use of the butterfly totem symbols. The puffs of smoke blown into the liquid represent the rain-clouds which the Hopi farmers desire, and the asperging to the cardinal points is prayer for much-desired rain, the act being a kind of magic for that purpose.

THE PUBLIC DANCE

The public dance is performed by many women bearing basket-trays in their hands, and consists of a series of posturings of the body in raising and depressing the baskets in rhythm with their songs. During the dance these women form a ring, facing each other, from which they do not move until they file back to the kiva.

Two girls, dressed to personate the *Owakül* maids, enter the plaza after the others have begun their songs. On the ground before them they roll netted hoops at which they throw objects made of corncobs with attached feathers. These girls also carry bundles of basket-trays which they cast among the spectators who struggle for their possession.[1] The *Owakülti* dance closely resembles that of the *Lalakoñti*, the only striking differences being in the acts of the basket-throwers, their clothing, paraphernalia, method of posturing, and acts as they enter the plaza. The actions of the basket-bearers of the two ceremonies are practically identical.

CONCLUSIONS

The theory that the Hopi tribe has been formed by the drifting together of several clans or groups of clans differing in language, religion, and secular customs has been discussed in former papers, and an acceptance of this theory would imply that each of these component clans, when it inhabited its own pueblo, practised a worship of its clan-ancients. These incoming clans having been merged into the tribe, they bequeathed to the latter its distinct cult, which still survives in modified form, imparting great complexity to the Hopi ritual. The study of the clan *wími* naturally leads the ethnologist to the migrations of the clans which introduced them. Two questions suggest themselves regarding this consideration: What clans now own the *Owakül wími*, and where did these clans live before they came to Sichomovi? An answer to the former is not difficult, and in the latter we can hardly hope to go farther back than a few centuries. We have, however, archeological as well as legendary evidence to guide us in both cases.

The *wími* of the *Owakülti* altar are owned by the *Pakab* (Reed), *Buli* (Butterfly), and *Kokop* (Firewood) clans. The chiefs of these clans claim this ownership, and those of other clans assent to this claim. We are specially concerned with the second question—Where did these clans live before they became incorporated in the Hopi pueblos? The old pueblo of Awatobi is commonly regarded as a former home of the first two; but none of them went directly from that place to Sichomovi for the simple reason that the latter pueblo was not founded before the middle of the eighteenth century, whereas Awatobi fell in the opening years of that century. A brief reference to traditions of these clans may be of interest.

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[1] Basket dances among the Hopi have elsewhere been described and figured, hence it is unnecessary to repeat the accounts.

The *Pakab* (Reed, Arrow?) clan is intimately associated with the *Awata* (Bow), from which Awatobi took its name. After the overthrow of their home, the women were carried to the Middle mesa where a pueblo was built near the spring on its eastern side. Later this site was abandoned, some of the population going to Walpi. Tcosro, the woman chief of the *Owakülti*, belongs to the Eagle clan, associated with the *Pakab*, and she owns most of the altar *wími*, especially the chief fetish —the society's *tiponi*. Traditions are all in accord that her clan lived in ancient times at Awatobi. Other *wímí* of the *Owakülti* altar are owned by the *Buli* or Butterfly clan, also said to have formerly lived at Awatobi. The history of this clan after the destruction of its former home is obscure, but this fact seems clearly made out from traditions as well as from archeological evidence: those members who survived the massacre joined a settlement of *Honani* or Badger clans near Oraibi, and in the course of time the composite *Buli-Honani* people moved to Oraibi, from which pueblo a *Honani* or *Buli* woman later went to Sichomovi, introducing the clan into that pueblo.

A third clan prominent in the *Owakülti*, also owning some of the *wímí*, is the *Kokop*, which formerly lived at Sikyatki, one of the oldest pueblos in the Hopi territory. An early home of this clan was Jemez, New Mexico; and possibly one reason why it affiliates with the *Pakab* and *Buli* clans in the *Owakülti* ceremony is the fact that all three were of the same eastern origin and possibly at one time spoke a cognate language.[1]

The reason *Owakülti* is celebrated at Sichomovi and not at Walpi, the most populous pueblo on the East mesa, is that most of the members of the *Buli* clans live in that village. There are no women of these clans at Walpi or Hano, and the first *Honani-Buli* woman to settle on the East mesa came from Oraibi and lived in Sichomovi.

Legendary evidence thus indicates that the village of Awatobi was the former home of the clans whose descendants now own the *wími* and control the celebration of the *Owakülti;* or, as otherwise stated, the festival was introduced into the present Hopi pueblos by descendants of those who survived the destruction of Awatobi.

There is archeological evidence in support of the statement that the *Owakülti* was known to the Awatobians. In early times the uprights of the altars were flat stones upon which symbols were depicted. Some of these still survive in modern altars, and others have been excavated from ancient ruins. Some two years ago several stone altar-slabs were exhumed from Awatobi by Mr T. V. Keam, and the designs upon them have been identified by several old Hopi as *Owakülti* symbols. Thus archeology adds evidence to that derived from tradition and sociology that the altar with its characteristic symbolism came from Awatobi.

There is also evidence which leads to the conclusion that the Awatobians observed the following festivals: 1, A New-fire ceremony with accompanying worship of a Germ-god called *Alosaka.* 2, A woman's dance called *Mamzrauti.* 3, A warrior celebration called *Momtcita.* 4, A *tablita* dance like that of Acoma. 5, The woman's Basket dance called *Owakülti.*

The evidences that a New-fire ceremony, similar to that annually observed at Walpi, was once performed at Awatobi are both traditional and archeological. The most prominent god worshipped at this time was *Alosaka*, a Germ-god generally called *Muyinwŭ*. The shrine of *Alosaka* at Awatobi still exists, and the two *Alosaka* figurines from that shrine are still used by the Middle-mesa priests in their worship.

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[1] It is not intended to state that all originally came from Jemez, but there is little doubt that the nucleus of the Awatobi population came from the Rio Grande country.

One of the principal societies participating in the New-fire rites is called *Tataukyamŭ*, and legends directly state that this fraternity existed at Awatobi. Hani, chief of that society in Walpi, claims descent from Tapolo, the Awatobi chief of this society. A food-bowl from an Awatobi grave found by Mr Keam apparently represents a phallic dance of this society.

The *Mamzrau* society is traditionally said to have had its origin at Awatobi, and the story of the descent of the *tiponi* to Saliko has been mentioned elsewhere. There is archeological evidence supporting the claim that the Awatobians had a form of this ceremony. One of the main objects on the altar of this society at Walpi is a stick with spiral ridge called the "heart-twister." In excavations made near Awatobi, Mr Keam unearthed a spirally coiled stone which the Hopi identify as a *Mamzrau* "heart-twister." In connection with these coiled stones attention is called to an object, which is probably a similar fetish in a shrine at the gap on the trail to Hano.[1]

Certain clan ancients or *katcinas* are known as *Awatobi-katcinas*, and are reasonably said to have been derived from the pueblo from which they take their name. The symbolism of personations of these beings appears in certain pictures made for me by a Hopi artist, among which may be mentioned *Sowinu-katcina* and two monsters, *Soyok* (Keres, *Skoyo*, "monster") *taka* (male) and *Soyok wüqti* (female).[2]

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[1] These coiled stones are regarded as efficacious in the treatment of certain maladies in which the muscles are contorted on one side of the face, arms, or body.

[2] These are called Awatobi *soyoks*, and their symbolism is very different from that of Walpi.

CHALCHIHUITL IN ANCIENT MEXICO[1]

By ZELIA NUTTALL

The chronicle of Tezozomoc relates that when Ahuitzotl, the ruler of Mexico, extended his conquests southward, his forces had a decisive encounter (in A. D. 1497) with the united coast tribes, near Tehuantepec, and vanquished them. "The victors penetrated into the camp of the fugitives and sacked it. The elders and women came forth as supplicants and said: 'Valiant lords of Mexico, cease your fury, soften your hearts and pity these poor coast people and those of Tecuantepec, of Tutztecatl, and of Amaxtlan.'"

Upon this Ahuitzotl gave orders to cease the slaughter, and all sat on the ground in order to listen. Then Ahuitzotl said, "What are you saying? I shall bring it to pass that there shall be no more inhabitants on these coasts and that no one will be left alive." Then those from the coast answered: "Our lords, let us speak. We will pay you tribute of all that is produced and yielded on these coasts, which will be *chalchihuitl* of all kinds and shades, other small precious stones named *teoxihuitl* [lit.," the divine turquoise"] for inlaying in precious objects, and much gold, besides the most exquisite plumage to be found in the whole world, prepared skins of the ocelot, puma, and large coyotes, and various kinds of stones streaked with veins of different colors." (Chap. lxxvi.)

The above passage reveals how highly the Mexicans valued the chalchihuitl, since it figures foremost among the tempting prizes offered by the coast tribes. It also definitely proves that the stone was a product of the Pacific coast region.

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[1] Read before the Anthropological Society of Washington, April 23, 1901.

Historical investigation shows that from the time of Ahuitzotl to that of Montezuma, a period of twenty-two years, the coast tribes actually paid all of the promised tribute and periodically sent "strings of chalchihuitl beads," besides gold and turquoises, to their conquerors. The famous Tribute Roll of Montezuma, a copy of which was sent by Cortés to Charles V, records not only the names of towns situated along the Pacific coast which contributed chalchihuitl with other products, but shows us that the same stone was also sent to the capital from other parts of the country.

The following extracts from Book XI, chap. viii, of the work of Friar Bernardino de Sahagun, in which the learned monk discusses the properties of the native fauna and flora, metals and stones, further demonstrate that chalchihuitl was a recognized natural product of Mexico:

> Precious stones are not found in the beautiful polished and brilliant condition in which they are sold by venders. They are originally rough, without appearance of beauty, and are carried from the fields and villages. There are persons who know where precious stones grow because, wherever the latter are, they exhale, at dawn, a vapor like delicate smoke. Another sign indicates the place where precious stones are hidden, especially in the case of those called *chalchihuitls*. Wherever these are the grass which grows above is always green, for the reason that these stones continually send forth a cool and moist exhalation. Wherever this is the stones are to be found in which the chalchihuitls are formed. . . . There is a kind of stone called quetzal-chalchihuitl which is named thus because it is like the chalchihuitl and is very green. The good stones of this kind are without any spots and are transparent [translucent?] and very green. There are other stones named chalchihuitl which are not transparent and are green mixed with white. This kind is much used by the chieftains who string them and wear them around their wrists. They constitute a sign that the wearer is a nobleman. It is illicit for vassals to wear them. . . .
>
> There is another stone belonging to the species of chalchihuitl, which is called *tlilaiotic*, and is a mixture of black and green.
>
> Besides the above mentioned stones there are other jasper stones of many kinds and colors. . . . Some of these are white as well as green and are therefore called *iztacxhalchihuitl* [lit., "white chalchi-

huitl "]; others have green veins with light blue or other colors mixed in with the white.

The fact that, in the Nahuatl language, the current name for lapidary in general was *chalchiuh iximatqui* (lit., " he who works the chalchihuitl ") proves that there existed a native caste of skilled lapidaries whose highest attainment was the conversion of crude bits of the stone into the highly-prized beads and carved ornaments worn by the Mexican chieftains. It is interesting to find, in Sahagun, mention of the wearing of labrets and earrings of " false chalchihuitl " by ordinary people among the Otomis, a Mexican tribe.

Having gathered the above curious details concerning the knowledge and use of the stone amongst the ancient Mexicans, I was tempted to undertake the somewhat tedious and time-consuming task of localizing the various towns associated, in Montezuma's Tribute Roll, with the tributes of chalchihuitl. Many of these towns proved to have been situated in the ancient Mixtecapan, which comprised portions of the present states of Puebla, Guerrero, and Oaxaca, whilst others were situated in the state of Vera Cruz or in distant Chiapas, near the boundary of Guatemala. The accompanying outline map (figure 41) indicates the modern Mexican states which confine the localities associated with chalchihuitl in the Tribute Roll.

It was interesting to find how many of the ancient Mexican local names had remained unaltered to the present day, and it was easy to identify these and others, in the form of which slight alterations or abbreviations had taken place. Some names, however, have entirely disappeared, having doubtless been superseded by the names of saints which were bestowed upon all parishes by the Spanish missionaries. Local investigation would, in all likelihood, lead to the identification of a number of the places which I have not been able to trace on the modern maps consulted. I shall rely on my colleagues in Mexico, who have opportunities for doing so, to supply the missing information in course of time.

There is serious difficulty in the identification of a few of the ancient localities, due to the fact that the same names are frequently found applied to more than one place in the same or in a different state. In some cases the appearance, in the Tribute Roll, of a name, in a series of local names, affords a clue to its geographical situation, as towns are usually enumerated by districts. Rather than to make an identification which might prove to be misleading, I have preferred either to omit entirely, or to so designate, all that appeared in the least doubtful. It should here be stated that, in making investigations, I referred to the various series of maps published by the Mexican government as well as to others published in the United States by the Bureau of American Republics and by Messrs Rand, McNally & Co. The index to the last mentioned proved a valuable aid in some cases.

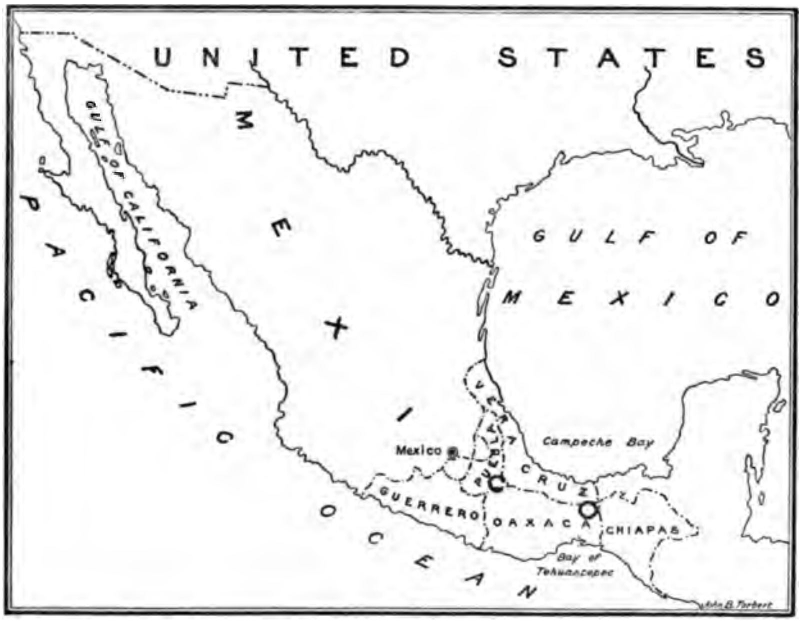

FIG. 41—Map defining the portions of ancient Mexico from which chalchihuitl was sent as tribute to Montezuma.

I shall now present the list of towns enumerated in Montezuma's Tribute Roll, with their names as they appear on modern maps and their localization in the actual states of Mexico. We shall begin with the localities situated in Chiapas, on the Pacific coast, near the frontier of Guatemala. Their inhabitants con-

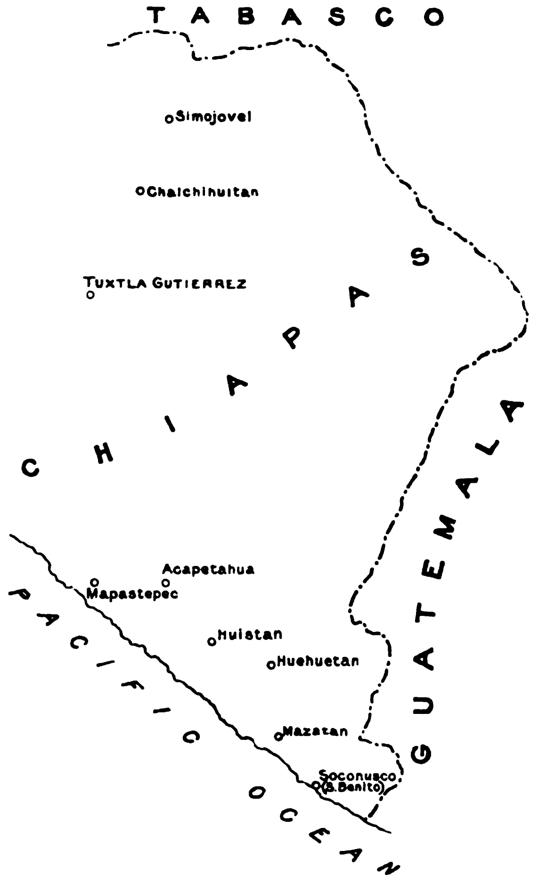

FIG. 42—Map of the southern part of Chiapas, in which are indicated six of the nine towns enumerated in Montezuma's Tribute Roll as contributing chalchihuitl.

tinued the struggle against the Mexicans after the conquest of Tehuantepec, and Ahuitzotl was obliged to send another expedition to subdue them. On yielding submission they too promised to supply their conquerors "forever with gold, emeralds, all kinds of precious chalchihuitl, etc." (Tezozomoc, chap. lxxix.) At the time of Montezuma only two strings of chalchihuitl' were exacted from them.

TRIBUTE: *Two strings of chalchihuitl beads.*

Tribute Roll	Modern maps
Xoconochco	Soconusco, State of Chiapas.
Ayotlan	(?)[1]
Coyoacan	(?)
Mapachtepec	Mapastepec, " " "
Maçatlan	Mazatan, " " "
Huitztlan	Huiztan, " " "
Acapetlatlan	Acapetahua, " " "
Huehuetlan	Huehuetan, " " "
Ochpaniztli	(?)

The exact geographical position of six of the above towns is shown on the map (figure 42), on which I have also indicated a small town, situated between Tuxtla and Simojovel, which bears the significant appellation of Chalchihuitan, lit., "The Land of Chalchihuitl."

Proceeding northward, we next examine the following lists of towns (figure 43) designated in the document as "situated in the hot lands."

TRIBUTE: *Four strings of chalchihuitl beads, three large pieces of chalchihuitl, three strings of chalchihuitl beads every six months.*

Tribute Roll	Modern maps
Tochtepec	Tuxtepec, Oaxaca.
Xayaco	Xayacatlan, Oaxaca.
Otlatitlan	Otatitlan, near frontier of Oaxaca and Vera Cruz.
Coçamaloapan	Cosamaloapan, Vera Cruz.
Mixtlan	Mixtla, Vera Cruz.
Michapan	Michi-apan, Oaxaca.
Ayotzintepec	(?)
Michatlan	(?)
Teotitlan	Teotitlan, Oaxaca.

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[1] This term appears to be identical with Ayotecatl, which was destroyed by the Mexican conquerors and is described in the chronicle as being situated a day's march from Maçatlan in the above list.

Tribute Roll	Modern maps
Xicaltepec	Jicaltepec, Vera Cruz (?).
Oxitalan	(?)
Tzinacaoztoc	(?)
Tototepec	Tututepec, Oaxaca.
Chinantlan	Chinantilla, Oaxaca.
Ayoçinatepec	(?)

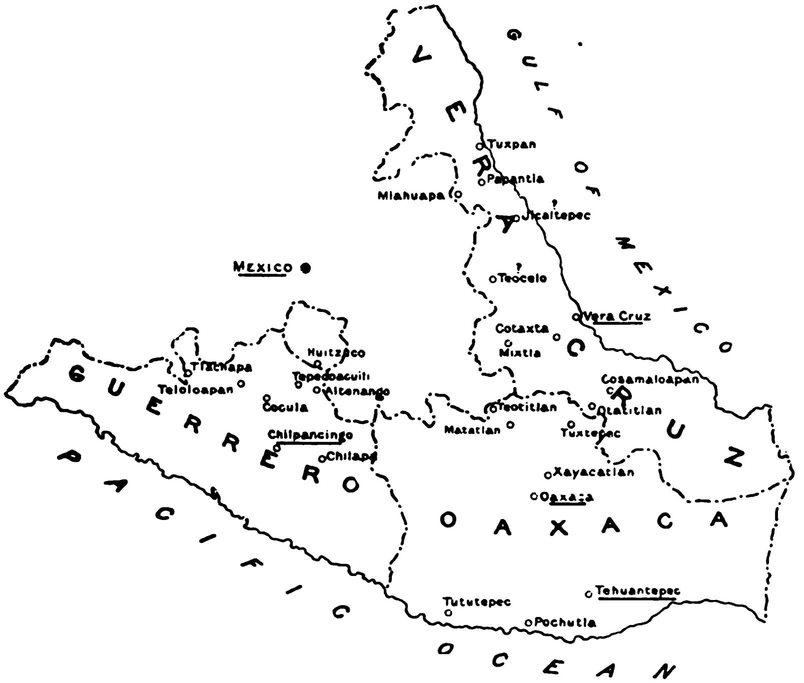

FIG. 43—Map exhibiting the towns situated in Oaxaca, Guerrero, and Vera Cruz, which are associated with chalchihuitl in Montezuma's Tribute Roll.

Cuezcomatitlan	(?)
Puctlan	Pochutla, Oaxaca.
Teteutlan	Teteutlan, near Atlixco, Puebla (?).
Tlacotlal	Tlacolula, Oaxaca (?).
Toztlan	(?)
Yautlan	Yauhtepec, Oaxaca (?).
Ixmatlatlan	Matlatlan, Oaxaca.

TRIBUTE: *One string of chalchihuitl beads every six months.*

Tribute Roll	Modern maps
Tuchpan	Tuxpan, State of Vera Cruz.

Tribute Roll	Modern maps
Tlatiçapan	(?)
Cihuanteopan	Zihuateutla, State of Vera Cruz.
Papantla	Papantla, “ “ “ “
Ocelotepec	Teocelo (?), “ “ “ “
Miahuapa	Miahuapa, “ “ “ “

TRIBUTE: *Five strings of chalchihuitl beads every six months.*

Tribute Roll	Modern maps
Tepecuacuilco	Tepecoacuili, Guerrero.
Chilapan	Chilapa “
Ohuapa	(?)
Huitzoco	Huitzuco, on border of Guerrero and Morelos.
Tlachmalacac	(?)
Yoalan	(?)
Cocolan	Cocula, Guerrero.
Atenango	Altenango, “
Chilcachapa	(?).
Teloloapan	Teloloapan, “

It is interesting to note how near to one another the above towns are situated.

TRIBUTE: *Two strings of chalchihuitl beads every six months.*

Tribute Roll	Modern maps
Cuetlaxtlan	Cotastla,[1] State of Vera Cruz.
Mictlanquauhtli	(?)
Tlalpanicytlan	(?)
Oxichan	(?)
Acozpa.	(?)
Teociocan	(?)

The largest number of identified localities in any single state is in that of Puebla, of which an enlarged map is given (figure 44). The tribute included only two strings of chalchihuitl beads; yet if one of these strings constituted a necklace, the number of beads may have been over one hundred, as in the necklaces described in the lists of presents sent by Cortés to Charles V.

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[1] Cotastla is now surrounded by towns bearing Spanish names, such as Mala Caterina, Obispo, San Francisco, Aurora, San Juan, etc. An examination of old documents might lead to the discovery of the ancient names of some of these towns.

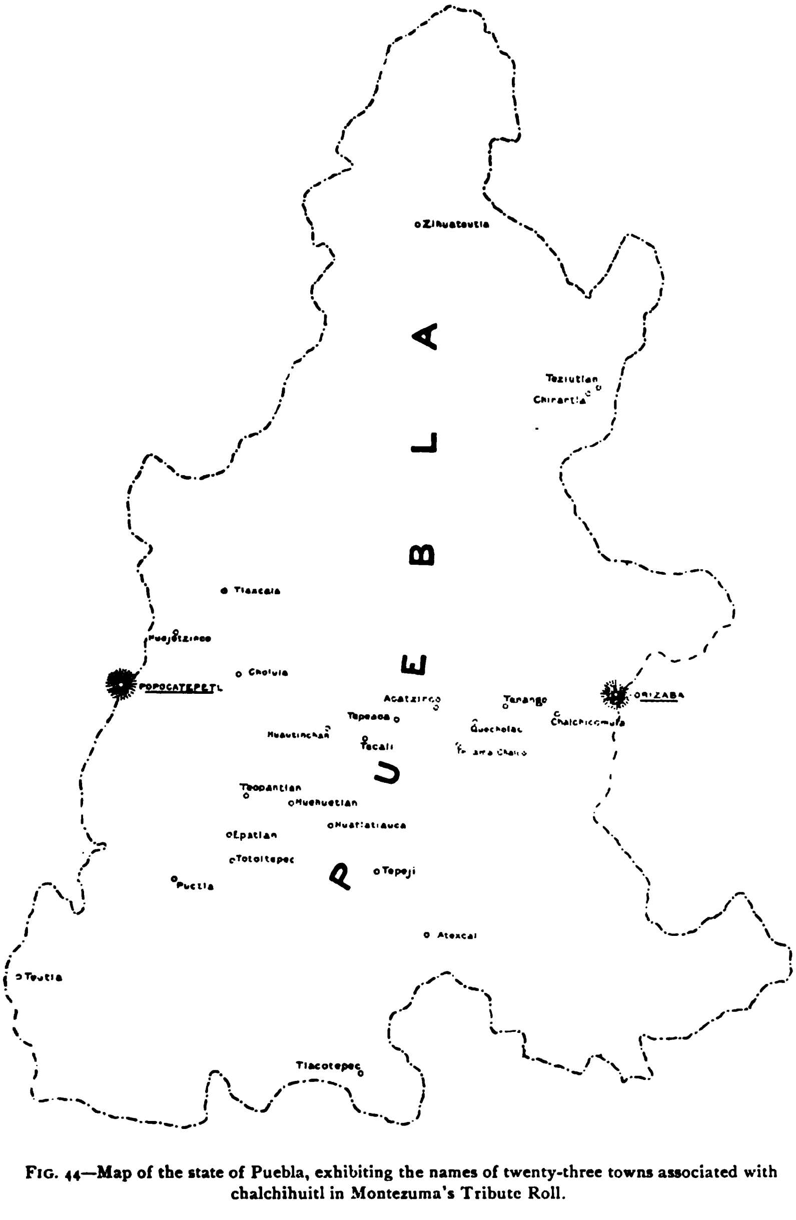

FIG. 44—Map of the state of Puebla, exhibiting the names of twenty-three towns associated with chalchihuitl in Montezuma's Tribute Roll.

Tribute Roll	Modern maps	
Tepeacac	Tepeaca,	Puebla.
Quechulac	Quecholac,	"
Tecama Chalco	Tecama Chalco,	"
Acatzinco[1]	Acatzinco,	"
Tecalco	Tecali,	"
Icçochinanco	(?)	
Quauhtinchan	Huauhtinchan,	"
Chictlan	(?)	
Quatlatlauh	Huatlatlauca,	"
Tepexic	Tepeji,	"
Itzucan	Izucar,	"
Quauhquecholan	(?)	"
Teonochtitlan	(?)	
Teopantlan	Teopantlan,	"
Huehuetla	Huehuetlan,	"
Atezcahuacan	Atexcal,	"
Oztotlapechco	(?)	
Chiltepintla	(?)	
Nacochtlan	(?)	
Epatlan	Epatlan,	"
Coatzinco	(?)	
Tetenango	Tenango,	"
Tlaxcaltecatl	Tlaxcala,	"
Cholulteca	Cholula,	"
Huexotzincatl	Huejotzinco,	"

The question naturally presents itself here whether, by following the indications conveyed by the foregoing documentary evidence, geologists may not be able, in course of time, to find in Mexico the chalchihuitl *in situ*. With a view to furthering so desirable an end, I subjoin a list of Mexican localities the names of which incorporate the word chalchihuitl.

Chalchiuhcuecan	Ancient name given to that portion of the coast adjoining Vera Cruz where the Spanish landed.
Chalchicomulan	Town in the state of Puebla.

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[1] The town of Chalchicomula is situated near Acatzinco, thus the word *chalchihuitl* is found to occur twice within the region around Tecama Chalco and Acatzinco.

Techachalco	Locality southwest of Chalchicomulan, district of Tehuacan.
Tecama Chalco	Town in the state of Puebla.
Chalco	Name of lagoon and town of same name. According to Ramirez the name was formed from "Chalchihuitl."
Tlaca Chalco and Coatepec-Chalco	Two localities situated between Chalco and Texcoco, state of Mexico.
Chalchiuhapan	Town in southwest part of the state of Puebla.[1]
Chalcatongo	Locality south of Tlaxiaco, state of Oaxaca.
Chalchiguitan	Town south of Simojovel, state of Chiapas.
Chalmita and Chalma	Localities, state of Mexico, district of Tenancingo.
Chalchijapa	Name of a river a tributary of which flows from the south into Rio Coatzacoalco, south of the state of Vera Cruz. This name may have reference to the color of its water only (?).
Sierra de Chalchihuites	Name of a small range of mountains running north and south; district of Sombrerete, state of Zacatecas.
Chalchihuites	Name of a mining town at the northern extremity of the above range. Contains silver and zinc mines.

The name Chalchihuites given to a whole range of mountains and to a mining town in Zacatecas claims attention.

The actual existence of towns in regions which anciently paid tribute of chalchihuitl beads to Montezuma, and of districts whose names incorporate the word chalchihiutl, undoubtedly constitutes a most valuable indication which deserves serious consideration by those interested in the possibility of finding jadeite in place. At the same time it must be admitted that, on the whole, the collective indications are vague and unsatisfactory, especially when it is remembered that, in the Tribute Roll, the towns which sent chalchihuitl beads also sent other and varied tribute; that they are recorded collectively, and extend over a vast area of territory.

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[1] Sahagun (Book C, chap. xxix) describes the house or oratory of Quetzalcoatl which was named Chalachiuhapan. This edifice was situated in the middle of a great river which flowed toward the town of Tula and there "the god had his bath-houses."

In two particular cases, however, the indications seem clear and are concentrated upon comparatively restricted districts. One of these comprises the compact group of six towns situated in the northern part of the state of Guerrero; the second consists of that portion of Chiapas in which I have located seven of the nine towns mentioned in the Tribute Roll. As documentary evidence, moreover, establishes the fact that chalchihuitl was a recognized product of the hot lands along the Pacific coast, and as Chiapas actually contains a locality designated as "The Land of Chalchihuitl," it seems but reasonable to regard the latter as the most promising field of investigation, not only for jadeite but also for gold and turquoise mines.

It is with the hope that they may be an aid and guide to future geological and mineralogical research that I submit the present communication and the foregoing notes collected during a prolonged study of documents relating to ancient Mexico.

NOTES ON THE ALSEA INDIANS OF OREGON [1]

By LIVINGSTON FARRAND

Of the many tribes which make up the population of the Siletz reservation in Oregon, one of the smallest and at the same time most interesting is the Alsea. Never strong in numbers, it has now shrunk to a few families and will doubtless soon be extinct. It is interesting particularly for the reason that it lies at about the southern limit of a particular type of culture where the more northern beliefs and characteristics begin to feel the influence of Californian tendencies. Unfortunately the tribe has remained up to the present time comparatively unknown to the anthropological world. Based on scanty observations by Hale and other early observers, their language, together with that of their neighbors and undoubted relatives, the Yaquina and Siuslaw, has been classed under the Yakonan linguistic stock. Two visits to the Siletz reservation were made by the late J. Owen Dorsey in the early eighties, at which times he collected information and linguistic material from many of the tribes on the reservation, and among others a small vocabulary from the Alsea, but even this, necessarily limited from lack of time, he was unable to publish before his death. One article by him on the local distribution of the Siletz tribes appeared in 1890.[2]

In 1890 Prof. Franz Boas visited the reservation, and among the physical measurements which he made at that time are a few of the Alsea,[3] but he had no opportunity of making an ethnological investigation.

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[1] Published by authority of the Trustees of the American Museum of Natural History.

[2] "The Gentile System of the Siletz Tribes," *Jour. Am. Folk-Lore*, 1890, III, 227.

[3] Seventh Report on the Northwestern Tribes of Canada, *Proc. British Ass'n Adv. Sci.*, 1891.

In the summer of 1900 the writer visited the Siletz in the interests of the Villard expedition from the American Museum of Natural History, with the particular object of collecting texts and general linguistic information from the Alsea with a view of determining the characteristics of the Yakonan stock if it should prove to be independent, or its affiliations should it appear to be connected with other recognized linguistic divisions. Peculiarly good fortune in the way of an Alsea informant produced a series of connected texts and translations, as well as a fairly extensive vocabulary and a mass of general grammatical material which will afford a basis for the desired investigation. Until this can be completed it may be well to offer a few notes of general interest.

Habitat.—The main seat of the tribe was at the mouth of Alsea river on the coast of Oregon, between latitude 44° and 45°, being flanked on either side by the related and friendly tribes of the Yaquina on the north and the Siuslaw on the south. When the Siletz reservation was formed immediately north of Yaquina bay, the Alsea, together with the other tribes of the western part of the state, were removed to the reservation and there are now no Indians left at the original tribal seat.

Physical Traits.—Physically the Alsea and Siuslaw are interesting as being the most southerly tribes which practised deformation of the head, this being done by the usual fronto-occipital pressure. The peoples to the south are distinguished by facial tattooing, which was practically unknown among the Alsea. In general physical characteristics the stock conforms to the type of the coast tribes to the north.

General Beliefs.—The Alsea believed that the earth is flat, the land floating in the water. They also believed in a sky country, resembling the earth, which was peopled by men and women in form like themselves, who went up and lived there at the time of the great transformation which will be mentioned later. There was also an underworld about which little definite information could be obtained. It was peopled entirely by spirits or shades of the dead and only by those apparently who had lived " bad " lives in this world. The entrance to the lower world was over the edge of this one, the shades of those doomed to go there passing through the air and dropping over the edge. When a bad chief died his shade could be heard flying through the air and dropping into the lower world with a loud "boom." In some of their stories there were allusions to other entrances; but no tradition of a regular visit to the underworld, such as is common to the tribes immediately to the north, could be obtained. There was also an abode for the good spirits of the dead, where the conditions of life were all favorable — no wind nor rain, where the water was level with the land, salmon and game were abundant, and life happy. This place was conceived of as being somewhere on this earth, but just where was not known. There is a possibility, of course, of missionary modification in these conceptions, but the impression given was that they are of native origin.

The Alsea practised surface burial in small huts, canoes, etc., and goods of all kinds were placed with the corpse; the explanation given of this custom was that the bodies were animated and moved about at night if they so willed, so easy exit from the graves was afforded and the things deposited were for their use under such circumstances. The dead sometimes gave material aid to the living; for example, a canoe made in the woods was sometimes found moved some distance toward the shore, and this could have been done only by friendly dead.

With regard to the earlier conditions in this world, the Alsea believe that it was formerly peopled by the present animals and birds in human shape, but who even then had the peculiar characteristics which distinguish them today; and besides these, there were a great number of monsters (*ānkī′*) which occupied all the most favorable spots and were constantly preying upon the people. At this time appeared Shīō′k, the Transformer, who, in his journey about the world, killed the *ānkī'* and at the same time changed most of the people into their present animal forms. During this period Shīō̆'k exhibited all the characteristics of a trickster which have come to be so well known in the culture hero stories of other parts of the world. Having completed his journey and work, Shīō̆'k went up to the sky country, taking with him many of the people of this world, and there they live to the present day. After his ascent to the sky Shīō̆'k is spoken of only by the term Dīĕwĭ't ("the Maker"), and always with reverence. No direct account could be obtained of Dīĕwĭ't's interference in human affairs, but it seems probable that such a belief is entertained.

Social Organization, *Marriage*, *etc.*—The ordinary northwest-coast system of social orders, viz., "nobility," common people, and slaves, prevailed among the Alsea. It was possible, however, for a common man, by reason of extraordinary power or wealth, to rise to the dignity of a chief and thus to raise his family in rank. A slave could never improve his position, an inability which may have been due to the fact that slaves were constantly changing hands and constantly deprived of a favorable opportunity for demonstrating their value. Slaves were obtained usually by purchase, occasionally by capture. Children of very poor parents were sometimes taken and sold to pay debts.

With regard to marriage, there was said to have been a decided preference for marriage with women from another tribe. This was explicitly stated of the nobility. At the same time there is evidence that the men did not care to go too far afield for their wives, for in such specific cases as could be cited, the favored tribes were the Yaquina and Siuslaw, whose languages are almost identical with the Alsea and who regarded each other as closely akin. It is more likely that the exogamous tendency was local and extended to villages rather than to tribes. The expressly forbidden degrees extended to any recognized relationship. Marriage was by purchase, the family of the man assisting him in procuring the purchase-money for the bride. The money thus paid was later refunded by the bride's family, apparently chiefly in the form of gifts and feasts, though the exact method is not clear. It suggests in certain ways the potlatch system of Vancouver island, for there was an apparent effort on the side of each family party to the contract to keep the other family in debt to it. Should separation of the couple occur for any reason whatever and there be debt on either side, the deficit had to be made good immediately. Should a child die, the mother's family was obliged to pay the father's family; this was apparently true even when the purchase-money for the bride had been entirely refunded, though the information may be inexact on this point. Should the wife be unfaithful, the wife's family had to pay indemnity.

When a child was born he was given a nickname. This he retained until puberty, when he received his regular name, which was ordinarily that of one of his ancestors on either side, no preference being given to either line so far as could be learned. He might take the name of a living man, but in that case the giver must assume another. The same name was never used by two living people, nor did the giving of a name carry with it any privileges of position or rank. The giving was permanent, names never being lent nor pawned, as is sometimes the case farther north. The same rules held in the case of females as of males.

With regard to inheritance, any property left by the deceased was divided among recognized relations without distinction of degree.

There was a marked tendency to local segregation of groups related by blood in every village. These consanguineous divisions often attained considerable size and were known either by some local name with the suffix *-hī'tsLEm* (people), or by the name of the recognized chief of the group with the same suffix. Definite information on the economic and political organization of these groups was not forthcoming, though it was evident that they possessed a considerable amount of independence, which probably depended largely on the size and strength of the particular ward. There was no sign of any totemic clan system.

The more important degrees of relationship will appear from the following partial list of terms.

In the list, the sign ' following a consonant indicates that it is slightly explosive; the sign ‘, that the letter is aspirated; superior vowels indicate suppressed sounds, otherwise the vowels have their continental values.

Father,	*tā‘.*	Uncle (father's brother),	*s*^{h}*īpk‘.*
Mother,	*tlī.*	" (mother's "),	*tātc.*
Grandfather,	*tīt‘.*	Aunt (father's sister),	*tātc.*
Grandmother,	*tīt‘.*	" (mother's "),	*kīmĭ́tl.*
Brother (elder),	*hāāt‘.*	Cousin (father's brother's child), Same terms as for own brother's sisters.	
" (younger),	*mŏ́ōtcĭk.*	Cousin (father's sister's child),	*hīā́.*
Sister (elder),	*sāā‘.*	" (mother's brother's "),	*hīā́.*
" (younger),	*k'sĭnt.*	" (" sister's "). Same terms as for own brothers and sisters.	
Son,	*kwān.*	Nephew (brother's son),	*tᴇmām*^{u}*s.*
Daughter,	*pīắtc.*	" (sister's son),	*sĭ́pxān.*
Grandson,	*k'ē*^{i}*‘p.*	Niece (brother's daughter),	*tk'ŏ́ōtc.*
Granddaughter,	*k'ē*^{i}*‘p.*	" (sister's "),	*sĭ́pxān.*

The terms for other degrees need not be presented here. A glance at the list suggests at once some interesting questions. It would appear that the paternal uncle and the maternal aunt stand in a more intimate degree of relationship to the individual than the maternal uncle and the paternal aunt. This seems evident since the children of the former are known by the same terms as own brothers and sisters, while the cousins who are children of the latter are known by the single term *hīā́'* and apparently are not distinguished as regards sex. But the problem becomes complicated again by advancing to the next generation, for we find that cousins' children bear the same term as nephews and nieces whether their parents be in the degree known as *hīā́'* or are regarded as own brothers and sisters.

Shamanism.—The customs connected with shamanism did not differ essentially among the Alsea from those of the other northwestern tribes which have been described so often. Any person was eligible to become a shaman and in the usual way by "training" and fasting. If the candidate wished to acquire supernatural skill or strength in any particular line, such as gambling or hunting, it was necessary for him to work on the appropriate instruments during the period of solitary fasting. This is interesting as an unconscious method of keeping the attention concentrated on a particular set of ideas and thus markedly furthering the appearance of the appropriate suggestive dream or vision. When a candidate returned from his fasting and announced that he had become a "doctor," the news was greeted with loud wailing on the part of his family, the explanation being that he would probably live but a short time owing to the hostility he was sure to arouse among rival shamans or in individuals against whom he might operate and who would not hesitate to take extreme measures of revenge. There was evident a curious half-contemptuous fear of the shamanistic powers which may betoken the beginning of a breakdown in the belief.

The methods of treating disease by the shaman were the usual ones of incantation and sucking, thus withdrawing the spirit of the sickness which had been cast into the body of the patient by some hostile shaman. The "doctor" usually exhibited in his hand after the treatment some object which embodied the extracted disease and which was taken away and diposed of with appropriate ceremony.

Traditions.—The tribal stories of the Alsea are grouped about the account of the Transformer and Wanderer, Shīō′k, mentioned above. A curious fact in connection with the traditions is that they were told only during one month of the year, which apparently corresponded to January. Every evening of this month the members of each household gathered and the tales were related until late at night, being continued the next evening from the point where they broke off the night before. They began with the story of Shīō'k, and branching off from that are said to have formed a connected series which consumed the entire month in the telling. After the month was past and the series ended, the tales were not told for another year. In the meantime the children were forbidden to discuss them among themselves and were punished severely if they disobeyed. This custom, the origin of which is not clear, probably accounts for the comparatively scanty knowledge of the traditions possessed by the younger Indians. Unfortunately no individual could be found who remembered the series, for under the influence of reservation life the custom has been discontinued for many years, and as the two or three old members of the tribe who yet survive were mentally incompetent and the younger members were unfamiliar with the stories, only a fragmentary collection could be made.

As has been stated, the central figure of the traditions is the Transformer, Shīō'k. The story of Shīō'k opens, as is the case in most of the northwest Transformer legends, with an introduction having little bearing on the hero's future wanderings and achievements. The Alsea version, however, gives no account of Shīō'k's ancestry, birth, or childhood, but presents him at the opening as full grown and not nearly so powerful as he appears later. A number of puerile incidents are given in which Shīō'k plays the part of a petty trickster, not always even successful; this is followed by a long voyage in a whaleskin, and, after his successful arrival on land, the typical journey along the coast northward as far as the Columbia river takes place, in the course of which he destroys the monsters who are harrying the country, fills the rivers with their particular kinds of salmon and other fish, and finally places at the mouth of each stream a man and a woman who become the ancestors of the people resident at each place.

Of the other stories which were heard, the majority were of the adventures of five brothers,—a different group in each case,—of whom the youngest brother was always the clever one who led the band and devised means for escape from dangers and difficulties.

While the character of the traditions is distinctly that of the Washington coast tribes of whose mythology we have accounts, it will be interesting to trace the influences in details which the neighboring Athapascan tribes on the south may have exerted. It is sincerely to be hoped that the information regarding these Athapascan as well as the other stocks of the Siletz reservation can be procured without delay, for the appalling death-rate in the group, due particularly to the ravages of tuberculosis, makes their early disappearance inevitable.

KOOTENAY GROUP-DRAWINGS

By ALEXANDER FRANCIS CHAMBERLAIN

The Kootenay of southeastern British Columbia and northern Idaho, by virtue of their language, rank as one of the distinct stocks of the Amerinds of North America. Their comparatively simple social organization also marks them as a people distinct from their neighbors. From the time of the missionary De Smet, early in the nineteenth century, they have been noted as a kindly dispositioned people, strong enough in mind and heart to resist much better than many other tribes the evil influences of white contact. Practically the only scientific studies of these interesting people have been made by Dr Franz Boas and the present writer[1] (who visited them in the summer and autumn of 1891). A mass of linguistic and ethnologic data was then accumulated, which has since been submitted to careful consideration and is now being prepared for publication.

In spite of the apparent rarity of picture-writings and certain other artistic phenomena in the Kootenay area, these Amerinds possess artistic ability of no mean order, as the three hundred or more drawings the writer has been able to obtain amply testify. From these the four large group-pictures considered in this article have been selected as exhibiting Kootenay art in some of its striking aspects. The subjects are: 1, Gambling game; 2, War dance; 3, Dance; 4, Buffalo-hunt. The last three are by an old Indian, the first by a young man of twenty-two years.

Gambling Game (figure 45).—This drawing represents the great gambling game of the Kootenay, which survives at present only among the Lower Kootenay tribe, the efforts of the missionaries

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[1] See *Rep. Brit. Assoc. Adv. Sci.*, 1889 and 1892.

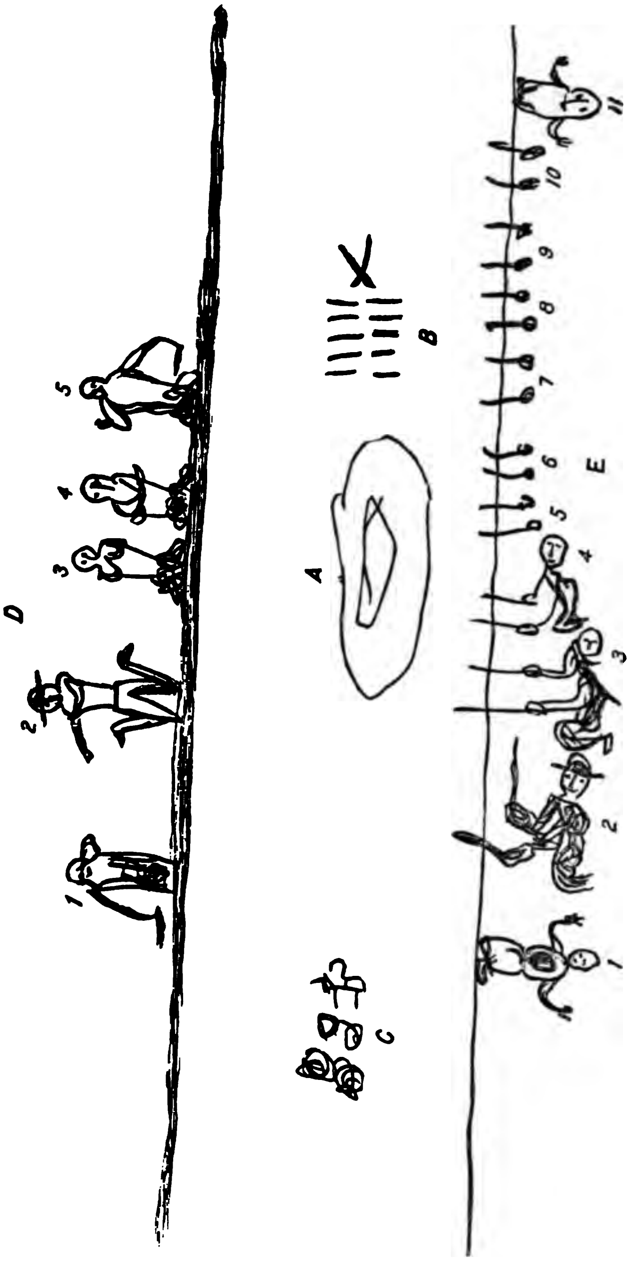

Fig. 45—Kootenay gambling game, drawn by Ámzlú.

having been sufficient to suppress it among the Upper Kootenay, who have come more under the better influences of the whites. The game is the one famous among the Indians of the northwest, with which is associated what Paul Kane, the artist-traveler, called "the eternal gambling song *he hah ha!*" The essence of the game is as follows:[1]

"The gambling consists in guessing in which hand one (on which a ring of bark is left) of two sticks of wood is hidden. The players sit in two rows facing each other, and a number of them keep beating on a log in front of them with sticks, while the sticks are passed from hand to hand. From time to time some of the players sing or contort their limbs in various ways." The yells and chants with which the gambling is interspersed are: *Hai yā! hai yā! hai yā hē!* repeated indefinitely; *hō hō! hā hā! hē hē! hai hai! hu hu! Iīī! yāēee*, etc. The game and its accompaniments have been known to last more than twenty-four hours, beginning with the evening of one day.

The drawing here reproduced was made by an Upper Kootenay Indian named ÁmEIū, one of the best and most reliable men of his tribe. So far as the writer was able to discover, he had never received any instruction in writing or in drawing of any sort, but was naturally intelligent and a rather skilful draftsman, as other specimens of his art procured by the writer abundantly prove. ÁmEIū presented this drawing (the writer had him under his eye during the making) as a token of regard, so that both the idea of drawing the gambling game and the mode of its execution belong to him without interference or suggestion of any sort by another.

The word for "gambling" is *gátlūwā'tsEnäm*. The details of the drawing are as follows:

A, Place for the fire (*ā'qkink·ō'k·ō*) in the center. B, Ten sticks (called *āqkō*) deposited in two parallel series of five not far from the fire, and just beyond them two sticks crossed. C,

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[1] *Rep. Brit. Assoc. Adv. Sci.*, 1892.

Articles gambled for; here are deposited blankets, knives, etc. D 1–5, Players. E 1–11, Players.

The man D1 has up to his eyes his left hand, which holds a stick (*kitā'kōpQō'mōtl*, literally "beating instrument," from *ki . . . mōtl*, instrumental prefix-suffix, and the radical *tākōpQō*, "beat") with which he beats the log in front of him.

The posture of the man D2 is curious. He stretches out his right arm somewhat downward and claps his left hand to his right shoulder. The term applied to this action is *kĭkunā'mē*.

The man D3 is rubbing his hands together and blowing upon them. The term for this is *gitlk·ū'pQō āqkē'is*, which seems to mean "wiping or rubbing the back of the hand."

The man D4 has his arms folded.

The man D5 is smoking a pipe (*nī'kinek·ō'k·ōnē*) and beating with a stick.

The man E1 has the gambling-sticks (*wū'nē*) between his palms and thumbs, and is crying long and loud: *Īĭ ! yā ĕ, ĕ, ĕ !*

The man E2 is beating the log with a stick, as are also E3 and E4. E5 to E10 are conventionalized forms of E3, E4. All these have sticks with which to beat.

It will be noticed that the men D2 and E2 wear hats. The artist seems not to have indicated the hair, while in one or two of the figures the mouth or nose is faintly, or not at all, shown. The attitude of figures E2–E4 is interesting, while the method of conventional representation from E5 to E10 is remarkable. The minute details of some of the figures have not yet been explained. As a sketch of a rather complicated group-game this picture, it must be admitted, is rather good work for a member of an Amerindian stock with no large basis of a pictographic nature on which to build.

War Dance (figure 46).—This drawing was made in twenty-five minutes by Blä'swā (*i. e.* François), an Upper Kootenay Indian, one of the oldest members of the tribe, and more recalcitrant than most of them to the influences of the settlers and

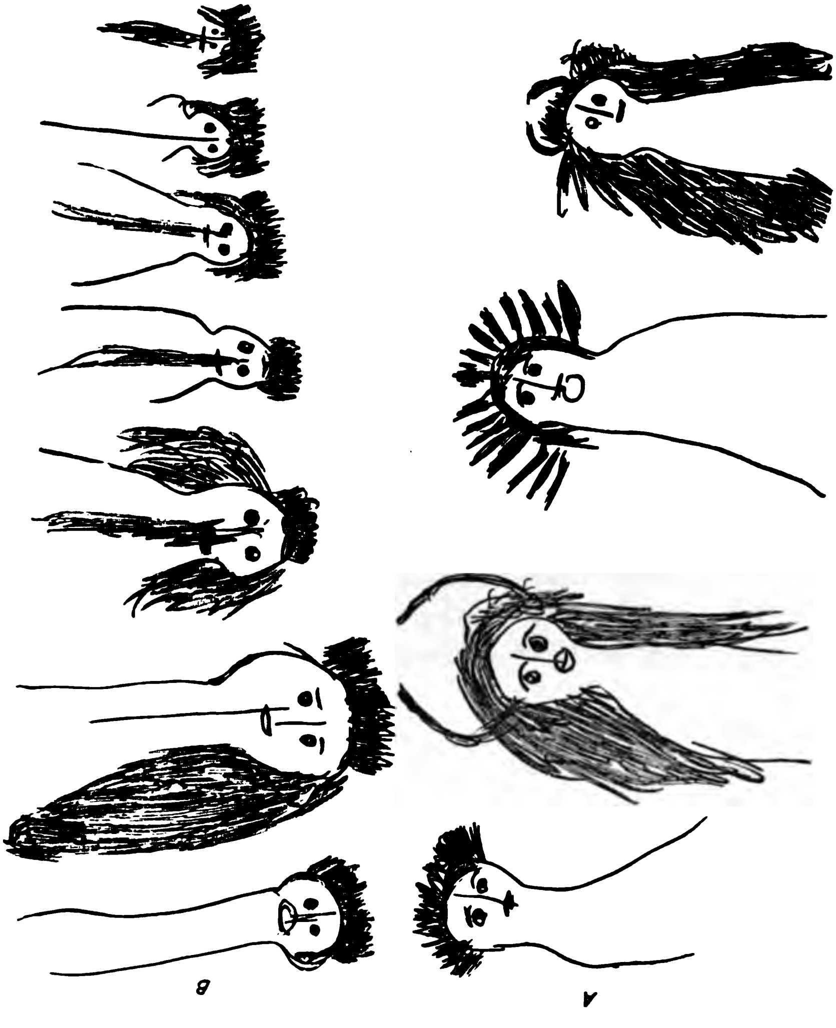

FIG. 46—Kootenay war dance, drawn by Blä'swä.

missionaries. While executing this drawing the old Indian's countenance evinced time and again the pleasurability of the recollections it called up. After he had completed his work, Blä'swā, who had been a famous warrior in his day, was so affected by the old associations recalled by it that, starting up with the paper in his hand, he danced and yelled for a few minutes to his heart's delight.

The details of the drawing, which represents a war dance against the Blackfeet, once the hereditary enemies of the Kootenay, are as follows:

A, Line of Kootenay dancers. B, Line of dead Blackfeet, "to show that the Kootenay have reason to celebrate"; the perpendicular long stroke in each case indicates that the individual is dead, perhaps originally the "count" of the slain.

The second and last figures in the line of Kootenay dancers are noticeable on account of the "horns" of weasel-fur with which their heads are ornamented. The third figure also has some particular headdress or arrangement of the hair, etc.

Some of the minutiæ of the figures are quite interesting. Not all of them have eyebrows, while the artist has omitted the ears altogether. The fact that the two lines of figures do not face each other is probably due to the Indian artist drawing toward and not away from himself where there is considerable to execute. The same Indian, however, drew the picture of the dance next considered, and there the heads, which alone represent the dancers, face one another.

Dance (figure 47).—The Indian Blä'swā, who made this drawing, described the scene it represents as *Kĭtōnāqā nākōwĭtlnē yū'nōkā'Enē*, or "many Kootenay are dancing." There are two rows of Indians facing each other in one of the common dances of the tribe. An interesting peculiarity of this picture is that the artist has chosen to let the heads stand for the individuals taking part in the dance, a conventionalization which may be contrasted with that employed by the artist of the gambling game. What significance lies in the fact that one of the lines has eight dancers

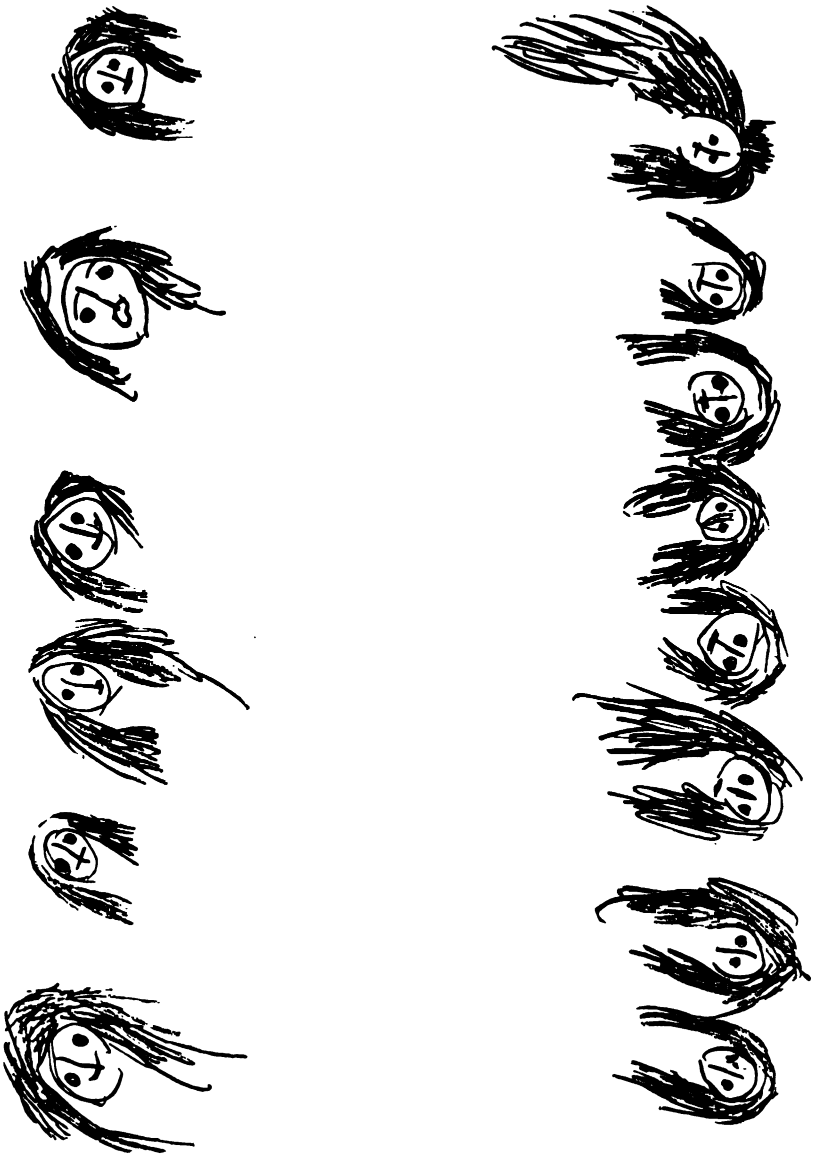

FIG. 47—Kootenay dance, drawn by Blä'swä̊.

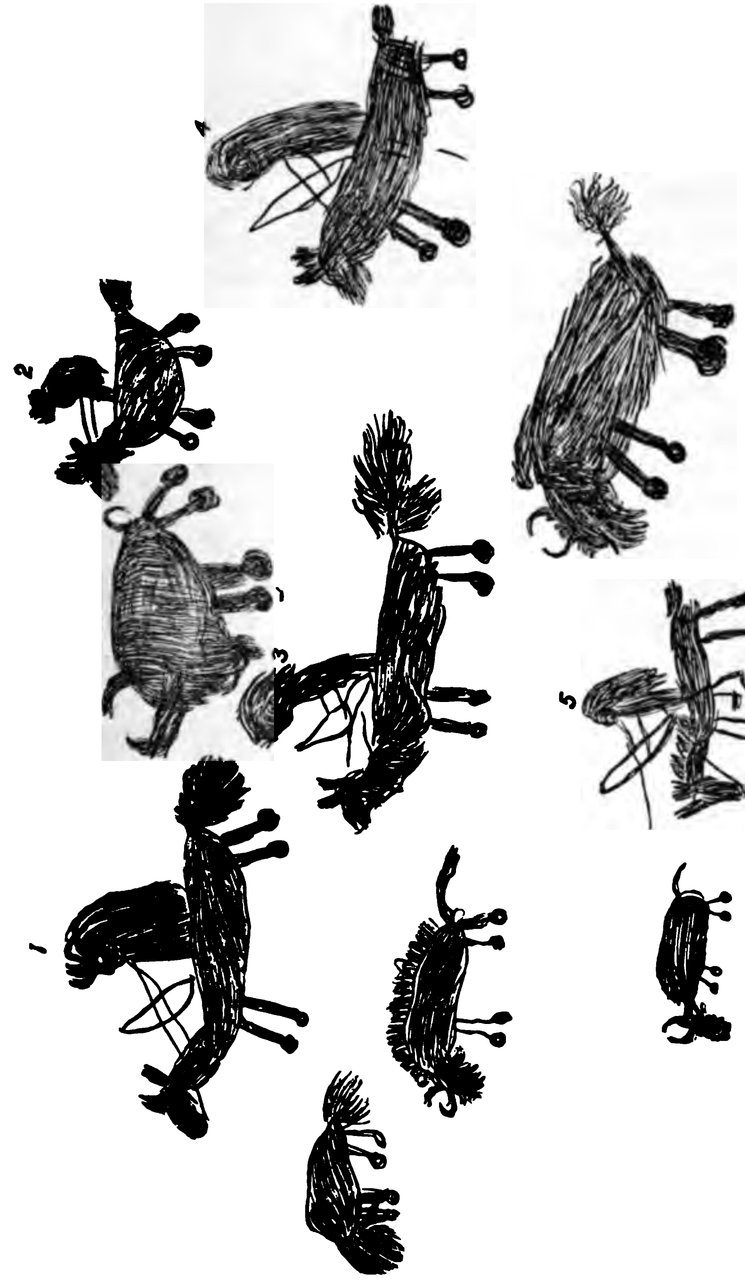

FIG. 48—Indian buffalo hunt, drawn by Blá'swá.

and the other only six is unknown; perhaps it is due to the artist.

Buffalo Hunt (figure 48).—Blä'swā called this drawing of his *K'ā'pē ā'qktsEmā'kinēk mitQanē nitlsik āqkī tlū'k'pū*, or "all the Indians are shooting buffalo bulls (*nitlsik*) and cows (*tlū'k'pū*)." Though much ruder (as indeed most of Blä'swā's work is) than many of the less elaborate drawings by other Indians, this picture may be looked upon as a Kootenay *magnum opus*. The Indian who drew it had not for many long years participated in such a scene as it depicts. It is thus a drawing from memory, and goes back to the days when several tribes of Indians (Kootenay, Blackfeet, etc.) used to join forces for the great chase of the buffalo on the plains east of the Rocky mountains. The predominance of the older order of things in the mind of the artist is seen in the fact that although the five Indians all have horses, not one of them has a gun, but all bows and arrows (*āqkō'kEmātlē'ētt'ā'wō*). The smaller animals seem to be cows, the larger ones bulls. That which Indian No. 5 is engaged in shooting is certainly a cow. Different Indian tribes (Kootenay, Blackfeet, Sarcee, etc.) are represented in the drawing; but, the key having been unfortunately mislaid or lost, the exact indications cannot now be given, since tribal differences do not seem to be emphasized in the various figures.

The four group-drawings considered in this brief paper are sufficient to show the capacity of these Amerinds for pictures involving more than a single object or incident, and their uniqueness may make them of service to students of Amerindian art. They suggest also the large possibilities of an untrained race.

ETHNOLOGY IN THE JESUIT RELATIONS

By JOSEPH D. McGUIRE

The recent publication of the *Jesuit Relations and Allied Documents* is the accomplishment of a most important undertaking. The work is in seventy-three volumes, the text being in French, Latin, or Italian, with a page-for-page English translation. The period covered by these records is that from 1610 to 1791, and the editor, Mr Reuben Gold Thwaites, of the Wisconsin Historical Society, should be congratulated on his work and that of the translators. While the documents relate chiefly to religious matters, in the many thousands of pages comprised in this work there are numerous references to the daily life of the natives which are of extreme interest to ethnologists. Many references to the manners and habits of the aborigines are contained in these records of the daily lives which the priests passed with them; they are simply told and there is no reason to question their accuracy.

The story begins with the first occupancy of a permanent nature by the French in Acadia and on the St Lawrence, and continues without break to the period of English supremacy.

It should be remembered that these relations involve no special theory, and their great ethnologic value is due to the fact that they are a collection of all the references made by a large number of intelligent men who lived for years among the people of whom they wrote. The priest lived in the village with the native, hunted and fished with him, tracked game and netted fish, and accompanied him not only on long tramps from point to point but on the often trying journeys on snow-shoes, and took his place at the paddle in the birch-bark canoe or in the dugout.

No one had described the people among whom the Jesuits settled, because no one had been brought in contact with them. When the Jesuits first visited them, they were living the life that had been for ages past the life of the country. When the first mission on the St Lawrence was established, the upper river was but little known; there were rumors of many rapids, of great bodies of water, and of vast settlements of people beyond. As the *courreur du bois* spread out in search of skins for the European market, the adjacent tribes became better known, and when trading stations were established the Indian came from long distances with the articles he had to barter. The priest was on the frontier, and he advanced up the rivers and across the numerous portages until the region of the Great Lakes became well known. We first read of the existence of a great river, the Mississippi, with many people living on its banks, and gradually this river is approached, and in 1673 Marquette made a long voyage down it, encountering new tribes and a different vegetation from that of Canada. As the river was descended the people appeared to be more enlightened than were those of the north; their villages were of more substantial character, and tribal government and worship were better organized.

The natives on a part of the Mississippi had heard of the Europeans at the east, and they possessed articles of European manufacture obtained by traffic with other tribes; they knew of the Spaniards in the southwest, and doubtless had not forgotten De Soto's expedition of 1540; but up to this period neither Spaniards nor English appear to have penetrated to the river as Marquette did. The Jesuit was the first to record the condition of the natives over a vast region in North America, each priest being required to make an annual report to his superior, and these reports, after being edited, were published for the benefit and information of those in France who contributed to the maintenance of the missions in Canada. The data appear to have been carefully selected, for throughout the publication there is scarcely a duplication of any ethnologic matter of interest.

The Indian of the St Lawrence, of the region of the Great Lakes, and of the Mississippi, when first visited by the priests, was living in a state of savagery and in an age of stone. He made, as man had made for thousands of years before him in a similar period in Europe, Asia, and Africa, implements of wood, bone, stone, and shell; he made pottery in the same manner as was done in the earliest period of which we have any knowledge; his possessions were similar to those excavated from the most ancient ruins known. These records, therefore, furnish material for a study of American primitive life which is calculated to be of great value in elucidating much of what is now obscure in the general condition of the human race during the stone age.

The use of metal, so far as these relations develop, does not appear to have been known, unless it was as a malleable stone or to serve the purpose of a fetish. Canada, at the time of the first missionary settlement, was covered with a dense and almost impenetrable forest growth, and was peopled by savages who lived by hunting and fishing and from the spontaneous productions of the soil. Their knowledge of agriculture was of the most primitive character. They had no fixed place of residence, but wandered from point to point in search of food according to the seasonal migration of game and fish, or the ripening of roots, nuts, and fruit; their surroundings were those of the stone age; their artifacts were such as are today found in the caves of Europe associated with the bones of extinct fauna.

The priest does not appear ever to have comprehended the religious beliefs of the natives, but saw in their ceremonies only an intimate association with the devil, while in their songs and dances he could observe only so many evidences of idle habits; nor do the natives appear for years to have grasped the purpose of the priests to convert them to the belief in one God instead of their hundreds.

Coming as they did from the centers of civilization, with established rules of life, the priests naturally witnessed many revolting scenes in their association with the aborigines. The savage saw life in all things, animate and inanimate alike; even the elements were endowed with life. Everything also had its special deity which was entitled to particular consideration—but to the priest all this was so much idolatry. In the prayers of the medicine-man the priest saw only impiety; the invocations to the numerous savage gods or supernatural beings were but so many blasphemies. The native doctor saw in disease an evil being which, to be eradicated, must be exorcised by prayer, or a being needing fire to drive it out, or something needing merely local treatment. Dancing was a function more than a pastime, for, rather than being an evidence of frivolity and idleness, it entered extensively into ceremonies of a religious nature, of thanksgiving or petition.

The bearing of the Indian was always serious and dignified. Many errors have been made in attempting to translate native expressions without intimate knowledge of the language spoken. Ridiculous stories were taken seriously and myths were asserted to be facts.

Whether or not the story is true that the words articulated in the far north became frozen as spoken, as the natives asserted they did, the priest does certify that all the sins committed in the woods during the winter's hunt were publicly confessed the day after their return. The myth that the only "wood" burned in the cold country was that consisting of deer horns annually shed, appears to have been a play upon words. The story of the immense depth to which feathers accumulated in the south—being sufficient to suffocate men and animals going through them—was received with some credence. Yet these relations are mild when compared with some of those of the sixteenth and seventeenth centuries, although told by many of the most trustworthy writers of the period.

The birch-bark canoe and its manufacture are described in detail, as well it might have been, for it was the principal vehicle of transportation of the people of a large section of the continent. By its means they not only navigated the interior streams, rivers, and lakes, but crossed arms of the sea and at times went quite far from shore in pursuit of game or fish. We find that the native shaped his canoe in accordance with the size of the body of water on which it was intended to be used. The boat had a high bow if heavy waves were likely to be encountered, as would be the case on the sea or on the Great Lakes, but a low bow was essential to safe passage under trees fallen across streams or under low-growing branches. The reference to obstructions or places around or over which canoes were carried, familiarizes one with aboriginal systems of water transportation. Reference is made to the construction of the skin boat of Hudson bay with its ribs of wood, to the sewing with root strings of the sheets of bark throughout that section where the birch flourishes, and to the burning and scraping into shape of the dugout of the southern countries. Each of these classes of boats appears to have been particularly well adapted to the locality in which it was employed; the capacity of the boats varied from a single passenger to fifty or more; all were paddled, there being no allusion to rowing. It appears singular nowadays to read of the Sioux as the most skilful of all Indians with the canoe. As was natural, reference is made to the fact that certain people did not use the canoe at all.

One would expect to find the Indian, living as he did under such primitive conditions, to be deficient in intelligence, but the most critical scrutiny, not only of the accounts of the Jesuits, but of those of Spaniards, Englishmen, and Dutchmen as well, shows that none of them failed to pay tribute to the Indian's knowledge of the woods and his skill in handling his canoe; to his quickness in making a shelter or house; and to the delicacy of finish of much of his handiwork. Indian children who were instructed in the schools are referred to as equal to white ones in mental development.

Much is written of war and forays and of the bloody customs which prevailed; but they differed in nothing from those of our own ancestors a few centuries back. When, however, the data are all collected, war (whether intertribal or between the whites and the aborigines) appears to have been for some purpose other than mere love of carnage; it has been brought about in almost every case by trade differences, the diversion of trade routes, or because of encroachment upon well-defined hunting boundaries. Baton Rouge received its name from the red trunk of a tree which divided the hunting limits of two tribes. The appreciation of the value of hunting grounds naturally increased as the supply of game diminished, especially after the gun had played such havoc among animals whose skins were sought for the European market.

The natives were found to vary greatly in both color and size, though they are usually referred to as a race of well-developed men and women, skilful hunters and expert fishermen. The distance which these people are said to have traveled in quest of trade or on predatory raids seems almost incredible.

The habits and customs of the natives at widely separated points appear similar—their clothes, or want of clothes, and their ornaments and implements differed only so far as the differing products of a region caused modification. Tattooing appears to have been general throughout the continents, as was also face and body painting. Much of the cooking was done by causing the water in the cooking vessels to boil by means of heated stones. Pottery was made, after universal primitive methods, with crushed shells or quartz sand mixed with clay; beads were made of many things, and their value was determined largely by their color; trinkets giving out sounds were common to all tribes, as was the native practice of medicine; nor do there appear to have been great differences in the general system of religious belief and practice. Implements were everywhere alike, and everywhere made as such things were made in Europe, Asia, and Africa when the people of those countries lived under stone-age conditions. Clothing was made of skin, and some references would suggest that feathers also were worked, as was done in Mexico and elsewhere, though nakedness was quite general.

The many references to mats and baskets throughout these regions suggest skill in plaiting; that such was the case is evidenced by the designs impressed on sherds of pottery found on every village site. Among the natives there appear to have been isolated tribes whose average intelligence was less than that of their neighbors, although it does not by any means prove that such was due to other than local causes and environment. We find that with stone and shell implements and by the aid of fire the Indians made the same tools which the earliest races possessed, and made them presumably in the same way.

The worth of an individual to the community was measured by his skill in hunting and fishing or by his bravery in war. From earliest youth boys were familiar with the movements of wild animals and knew when, where, and how to look for them. Everywhere the native knew how to make traps and nets in which various kinds of game and fish were caught to supply food for the family and, upon occasion, feasts for the community. The art of preserving food was everywhere practised; this was accomplished by drying in the air or sun or over a fire, and the food was also stored for consumption between seasons or for barter with neighboring tribes.

From one end of America to the other the native was reported to have eaten all living creatures—man not excepted,—barring the fact, however, that one dare not eat the flesh of the animal selected as his guardian or which was the totem of his clan, lest its shade should resent the action. In certain sections, however, one was allowed to consume even his totem animal, provided certain prayers and invocations were addressed to the shade of the dead animal, to which explanation was made of the necessity under which the individual labored through hunger.

Corn appears to have been raised throughout the continent, but it was probably confined to localities which had been burned over or flooded. Holes were made in the ground and a few grains of corn were thrown in; over these a little soil was cast, and the crop was left to mature without further attention, there being no early reference to systematic cultivation.

Fish ascended the streams at certain seasons, and along the shores and on the islands in Lake Superior many tribes met in friendly intercourse during the run of fish. It is singular that little, if any, reference is made to the shell-fish supply of the coast, for shells still remain in places several feet deep over many acres, and throughout these piles charcoal, potsherds, and broken bones show them to have been the kitchen-heaps of former residents. Berries grew in places in great abundance, and acorns and nuts were gathered as regular crops. There were vast herds of deer and buffalo, and the seasonal flocks of pigeons came in such vast numbers that they were often hours in passing a given point.

Notwithstanding these periods of plenty, hunger and disease were constant visitors, and it is difficult to say which caused the greater mortality. When the snow was deep the moose was easily tracked by means of snow-shoes; but when the ground was bare or the snow was light, starvation was common, and after eating their skin clothing, and even the lacings of their shoes, the natives ate one another.

The localities and special seasons for food were thoroughly understood by the Indians, who availed themselves of their knowledge and often caused resentment among other tribes who looked upon any intrusion as a trespass.

Everywhere distinction was drawn between the men's and the women's work. The man's work pertained to warfare, and to hunting and fishing with all that those occupations implied — the making of arms, the preparation of paints for personal ceremonial adornment, and boat making. The women attended to domestic affairs, cooked the food, sewed the skins together for coverings, plaited mats, and brought home the game killed, often staggering under the loads carried for enormous distances, and later adorning belts and clothing with colored porcupine quills and beautiful beadwork. Many instances, however, are recorded of men who, because of the illness of their wives, did the work of the latter, although it was commonly considered unmanly to do so.

From the many descriptions of the villages and of home-life generally, a fair picture may be drawn of the structure of the dwellings. According to locality, they were made of skin, birch or other bark, or of poles with rushes or reeds or even grass. In all settlements there appears to have been one structure larger than the others, answering the purposes of a town-house, where councils were held and the more serious affairs of the community were deliberated upon and decided with ceremony.

The individual, or rather the family, dwelling-house became more pretentious as one traveled southward. In its construction the women assumed the principal work, being aided by the men only in those things in which their own strength was insufficient. In the hunting field and on the journey an overturned canoe or a few branches thrown up as a windbreak served as a shelter.

Without law, as the whites understand the term, there were certain unwritten rules which all observed; everyone did as he wished, apparently, but these wishes always conformed with tribal custom. In affairs affecting the community, all who had attained the dignity of manhood were entitled to be heard; all opinions were considered, and the good of the community alone governed in the decision. There are not wanting references indicating that at times the women were allowed a hearing. All such deliberations were accompanied with ceremonies of a befitting character. There are many references to councils being held between hostile tribes and to messengers presenting themselves for the purpose of bringing about peace; they were always received with ceremony, and were fed and allowed to rest ere they were brought before the elders to state their mission. The function of smoking tobacco or other plants appears to have opened assemblies of every character. The speeches on these occasions were accompanied with offerings and exchanges of collars and belts of wampum, on or into which certain rude designs were worked in shell beads or porcupine quills. These pictographs were but a reminder to the messenger of his message, which, should he forget or misstate, would be corrected by his companions who had also rehearsed the speech.

The color for war with the Indians appears to have been black, though between them and the whites red and white were the relative signs for war and peace. In the earlier periods, after communication had been regularly established on the Mississippi, the French used the catlinite pipe as an emblem of amity in deliberations with the Indians, while Englishmen employed the wampum belt — the first peculiarly associated with the Sioux, the latter a product of the Iroquois. As Indian assaults were invariably in the nature of surprises, it may well be doubted whether the proposed attack was ever heralded in other than a general way. A planted arrow in the path leaning toward the people to be attacked would be a safer way to convey a hostile message than to send it by an individual, for delicate instincts would scarcely have protected one who declared war to exist.

At all serious deliberations medicine suitable to the occasion had to be made, and the medicine-man was an important factor to a proper consideration of the pending matter.

Dreams were regarded as real occurrences in the mystery or "spirit" world, and therefore were of greater importance than any ordinary daily occurrence. Misfortune seen in a dream would be sufficient to turn one back from a hunting or war expedition, and should such occur to a chief it would be sufficient cause for turning back a war party although it may have gone far on its journey. Prior to every deliberation the particular deity governing the subject was consulted and besought for success. These functions were accompanied with dances to the music of drums and rattles, which were common to all the tribes.

War having been determined, the war-chief began his preparations for the campaign. A war-dance was held in which all warriors who were to participate joined; in this dance, which was characterized by much savage splendor, the warriors in turn, in the presence of the assembled multitude sometimes consisting of many tribes, related their experiences in previous wars, and promised yet more potent results in the approaching campaign.

The difficulty of successfully carrying provisions sufficient for the war party when the seat of hostility was at a great distance, forced the members to send out hunting parties to replenish the food supply. On the march careful scouting parties were sent in advance, and special care was taken during the evening meal, while the fire was lighted, to guard against surprise. All fires were extinguished before dark, and the war party slept without guards. Simultaneous attacks were often made at different points, and all who resisted were mercilessly despatched. But with singular tribal unanimity the women and children were spared. Those too old or too feeble to keep apace while on the march were killed, and the scalps of all dead persons were preserved as trophies. Captive women and children were absorbed into the tribe taking them.

On the return of a war party the scalp-dance appears to have been a general occurrence, though the great spectacle was the reception of the prisoners taken. At times they came by water and were made to stand in the canoes and chant their death-songs while the captors beat time with their paddles; at other times the population of a village received them drawn up in double rows and often added violence to their jeers. The final act in the drama was when the prisoner was required to stand tied to a stake, often on a platform where he was in view of all, then was slowly tortured and finally burned to death. During this supreme trial the prisoner chanted his death-song and recounted the suffering which, in former raids, he had caused his tormentors, hoping thereby so to enrage his enemies that they would promptly end his torment.

Nowhere on the northern continent was the art of writing known, or even a pictography developed beyond the rudest figure painting. The art of signaling with columns of smoke (fire being produced by rubbing two sticks together) was well developed. A bunch of grass in the path, a colored stick stuck in a prominent place, and other simple contrivances conveyed well-known meaning to those encountering them; chips thrown out of a canoe were sufficient to give the direction when a fog shut in the landscape.

There were well-known "signs" familiar to the woodsman or boatman that conveyed messages to friends and enemies. The creaking of a cricket, the croaking of a frog, the hooting of an owl, the barking of a fox, and other animal sounds had special meanings; other cries signified good or bad news, or gave notice of the approach of a messenger.

The gun of the white man drove off the immense herds of game—of moose, of buffalo, and other animals,—and as the fields furnishing valuable skins were exhausted, these same weapons were employed to enforce claims to new hunting grounds; and finally were supplied to French and English allies to enforce trade pretensions.

The French early tried to lead the Indian to appreciate the benefits of sedentary life and a knowledge of agriculture; to do so they had, as Father Mercier said, to lead a savage life with savages. This is proven by the fact that nine missionaries of the first forty enumerated died violent deaths, almost all at the hands of the natives, and several of these underwent torture. The priest lived with the natives, and to do so, whether in the canoe, on snow-shoes, or in the field, if he would have a man's ration he was required to furnish a man's strength. Of all the discomforts endured, that which seemed to be greatest was from the dense smoke in the houses, which at times caused the inmates to lie for hours with their mouths to the ground to get breath or to lessen the pain of their eyes.

Alcohol was sold to the Indian in defiance of law and often through collusion of the traders with government officers. Liquor caused greater and more widespread suffering than did the many ravages of smallpox and cholera.

Rivalries in trade between tribe and tribe, between English and French, and between those among the French having concessions and those prohibited to trade with the natives, caused continual broils and too often entailed the horrors of war.

There grew up a currency in peltries which were exchanged or guns and powder, looking-glasses, porcelaine beads, ocher, vermilion, and woolen clothing in addition to foodstuffs in increasing quantities as game became scarcer.

Everywhere the native venerated his dead and furnished certain supplies for use in the great beyond—not that the article-themselves accompanied the dead, but that the "spirits" of those things which were buried accompanied the body's shade, while the reality remained in the grave.

The child-like spirit exhibited by the missionary was sublime. There was little complaint, though terrible suffering. The baptism of a dying child was considered sufficient recompense for every hardship undergone.

RARE BOOKS RELATING TO THE AMERICAN INDIANS[1]

BY AINSWORTH R. SPOFFORD

I have been asked to contribute some facts and comments regarding rare books that relate to the American Indians. The "Red man" of our country has been very copiously written, about by the White man; and this Society may well continue its researches—already so abundant—into the history, the remains, the characteristics, and the literature of a fast vanishing race.

The books and pamphlets relating to the aborigines of both Americas and their islands amount to many thousands of volumes, in many languages—Latin, Spanish, French, English, German, Dutch, Italian, Portuguese, Swedish, Russian, and native Indian of any varying dialects. In so wide a field, as well trodden as it has been by the published researches of so many investigators, I can only touch, by rigorous selection, upon a very few salient points, my remarks being restricted by the brevity which befits the occasion.

The writings upon the subject divide themselves into several theses, more or less distinct, namely—

1. Early discoverers and explorers, who have written about the Indians.
2. Histories of the Indians, whether general, or relating to some one race or group of races.
3. Narratives by or concerning missionaries among the Indians, in whatever period.
4. Narratives of captivity among the Indians.
5. Works of fiction and poetry founded on Indian life.

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[1] Read before the Anthropological Society of Washington, May 7, 1901.

6. Books in or upon any of the native Indian languages.

7. Treatises of any kind or variety of subject relating to the Indians.

In each of these groups are to be found books which have become rare: and the examples which I shall cite in any of them may illustrate both the early indifference and the later enthusiastic zeal of the collectors of libraries, both public and private. In the few examples given I shall not adhere to the classification which a larger essay would invite, but shall preserve the chronological order.

We have to regret the lack of any Indian bibliography which is at all comprehensive in its scope or its materials. The vastness of the field, as well as the unremunerative character of such labor, readily accounts for this. Of all the productions of men of letters, that which is most signally useful to the world—I mean the supply of keys to knowledge, or bibliographies—is the least honored with pecuniary reward. The author of a flimsy work of fiction, full of trifling conceits and morbid unrealities, makes thousands of dollars out of books that are forgotten as soon as read; while the careful student, who gives his days and his nights to unlocking the widely-scattered stores of learning on any subject, that all men may find what they want without search or delay, finds no publisher for work for which there is no popular demand. Hence the compiler of any bibliography engages in a labor of love, for which his sole reward is the love of the discerning, who profit by his labors, if they ever reach the happy consummation of print.

We have, however, several catalogues representing portions of the great wilderness of Indian bibliography. The first of these in point of time was Hermann E. Ludewig's *Literature of American Aboriginal Languages*, published by Trübner & Co., London, in 1858. This gives a list of such vocabularies and grammars of Indian languages as had appeared up to its date, now near half a century ago. Dr Ludewig was a German-American lawyer (*b.* 1809, *d.* 1856) of wide learning, and addicted specially to literature, as shown in his treatise on *Bibliothekonomie*, his *Livres des Ana*, and his *Literature of American Local History* (1846). His bibliography of the aboriginal languages was completed after his death by the aid of Prof. W. W. Turner, of the Smithsonian Institution, a learned Indianologist, Dr E. G. Squier, and N. Trübner, its publisher.

Thomas W. Field published in 1873, at New York, what he modestly named *An Essay towards an Indian Bibliography*, in an octavo volume of 434 pages. Mr Field was a school superintendent in Brooklyn, where he died in 1881. He was from early life an eager student and book collector, and became so earnestly interested in the literature relating to the American aborigines, that he compiled and printed at his own expense this work, which forms, although very incomplete in its range (being confined almost wholly to works in Mr Field's own collection), the most comprehensive book yet devoted to Indian bibliography. It gives collations (not always correct) as to number of pages, dates, and places of publication, but frequently omits publishers' names; and it abounds in typographical errors, arising from faulty correction.

Much more valuable as examples of thorough and accurate bibliographic work, are the various publications of the late James C. Pilling, prepared for the Bureau of American Ethnology, and published at intervals between 1885 and 1894, inclusive, by the government press. These cover nine distinct volumes or monographs, each devoted to books or other publications in or upon an Indian language, or group of languages. These are the Eskimo, Siouan, Iroquoian, Muskhogean, Algonquian, Athapascan, Chinookan, Salishan, and Wakashan tongues. Pilling prefaced these most elaborate works by editing a large quarto volume of titles, styled *Proof-sheets of a Bibliography of the Languages of the North American Indians*, containing 1175 pages, with facsimiles of titles. The edition was limited to 110 copies, distributed only to collaborators, including several public libraries whose officers had coöperated in the work by furnishing collations or information.

The great value of Pilling's contributions to Indian bibliography is fully recognized by scholars and librarians at home and abroad. Those who know most of the subject and its difficulties are most earnest in praise of the careful labor which has illustrated this branch of bibliographic science by models of finished work of permanent value. Every book or pamphlet named has been analyzed to its innermost minutiæ, by critical acumen and vigilance untiring, until it may fairly be affirmed that any work once described by Pilling leaves nothing for future bibliographers to do. Our only regret must be that a life so full of usefulness to the science of sciences, bibliography, which includes in its sweeping survey all the products of the human mind, was not prolonged until other and broader worlds of bibliography were conquered. It is strange that one who worked so rapidly should have made so few errors. Never satisfied with title-pages or indexes, he pursued his search through thousands of volumes, if haply he might find some Indian information, however fragmentary.

In his ardent quest for completeness, Pilling visited in person most American and foreign libraries, both public and private, which were notable for their possessions in Americana; and he undertook a wide correspondence with missionaries, Indian agents, publishers, librarians, etc. in the west and in Europe, to procure titles or information not found elsewhere. His painstaking method was rigorous and complete; he continually kept the commandment, vital to the salvation of every scholar, never to take anything for granted. His catalogues were arranged on the dictionary plan—authors and subjects in one and the same alphabet—the only time-saving method of catalogue-making. Every title-page recorded by him was divided into lines by vertical marks, a device which is most important in identifying editions. The paging, maps, and plates were all indicated with scrupulous accuracy, and he aided the reader by inserting in Arabic figures the years of publication, bracketing them just after the cumbrous Roman numerals—those time-consuming old humbugs which would have been long since abolished in books, but for the chronic human reverence for antiquity and precedent. Every edition of each work seen or heard of was chronicled with as much care as the first edition, and the libraries in which the copies described were seen were specifically named. I may note, in passing, that Pilling records that "the best collections of Siouan literature" found by him were in the Library of Congress and in the British Museum; also, that the second best collection of Arctic literature was in our National Library, and that "the largest collection of Iroquoian texts" he had seen was that in the Library of Congress.

All of Pilling's volumes are illustrated by facsimile title-pages of the rarer books described, taken by photographic process, and these lend great interest to the work, as most readers cannot see the originals. These life-like facsimiles number no fewer than eighty-two in the Algonquian volume of the series.

One of the marked features of these bibliographies is the numerous biographic notices of writers of books about the Indians. Very many of these are original, and embody personal information not found in any printed work. In the Library of Congress, where a manuscript index is kept of the biographic sketches of Americans found scattered through periodicals, these references are added to the list.

I now come to some examples of the rarer and more precious books involved in this brief inquiry. Passing by the excessively scarce and in some cases unique tracts containing one or more letters of Columbus, printed in the year of America's discovery, or the year following (one of which, dated 1493, was sold twelve years ago for $2900 at a New York auction), I come to what is said to be the very earliest systematic and detailed account of the character and habits of the American Indian. This appeared in 1516, in the Latin treatise of Peter Martyr, of Anghiera. He was an Italian of noble family, and an accomplished scholar. He knew Columbus, Cortés, Americus Vespucius, and Cabot, and his work has all the credit of intelligent personal observation by one who was for years a member of the Spanish Council for the Indies. The original is entitled *De Orbe nouo decades*, and was printed at Alcala.

The first three decades of Peter Martyr's work (which was completed in eight decades in 1530) were translated into English by Richard Eden, and published at London in 1555; to these were added the narratives of several other early voyagers.

The earliest recorded exploration giving an account of the Indians of Canada (preceding by nearly a century the settlement of Virginia and New England) was that of Jacques Cartier, in 1533. The first edition of his Relation was printed at Paris in 1545, with the title *Brief Recit, & succincte narration, de la nauigation faicte es ysles de Canada*, etc. Only one copy of this book, it is said, is known to exist. An English translation appeared at London in 1580, containing a vocabulary of the Canadian Indians' language.

The earliest account of the Indians of Florida was in the Relation of Cabeza de Vaca, which appeared in 1542 from a Spanish press at Sevilla. It bears the title *La relacion que dio Aluar Nuñez Cabeça de Vaca en las Indias*, etc., with a second part (1555) called *Comentarios*, and relates the long wanderings of its author among the Indians. He traversed the continent, across from the coast of Florida to the Pacific ocean, during nine long years of hardship and privation. One hundred copies of Buckingham Smith's translation of Cabeza de Vaca were printed at the cost of G. W. Riggs, Washington, 1851, in quarto, now rarely found. The Spanish original has been sold at New York and London book auctions at $52.50 to $185 during the last ten years.

The Mexican books printed prior to 1600 are among the rarer nuggets sought by philologists and amateurs. Molina's *Vocabvlario en la lengva Castellana y Mexicana*, first printed in 1555, in quarto, is one of the almost unfindable books at any price. The second edition, in folio, Mexico, 1571, is more common, but copies have brought $170 in 1884, $90 in 1890 (Barlow sale), and $61 (poor copy) in 1899 (Philadelphia sale). Both editions are in the Library of Congress.

Although not among the rarest of books relating to our subject, I cannot pass without notice the writings of so famous and devoted a friend and champion of the Indians as Bartolomé de Las Casas, the good Bishop of Chiapas. His early tracts, printed in 1552 at Sevilla, number nine or ten volumes in small quarto, in gothic type. The first in point of composition, the *Brevissima Relacion de la Destruccion de las Indias*, has been translated into more languages and reprinted in more numerous editions than any book relating to the American Indian. Written by one of the companions of Columbus, and an eye-witness of many of the cruelties and atrocities which he relates, the works of this great scholar bear the authentic seal of truth. They are the more impressive as embodying the stern judgment upon Spanish misdeeds in America of a churchman and a contemporary. With a vigor of denunciation rarely equalled and an eloquence never surpassed, he describes the inhuman tortures and wholesale murders of the Indians by their Spanish oppressors, whose career of conquest and of tyranny in America (as in the Netherlands) was literally written in blood. Severe and scorching as was the powerful indictment of Las Casas, it is hardly strong enough to express the emotions felt by every generous mind in the contemplation of crimes so foul and damnable. In his vivid pages we see the Spanish conquerors of America pilloried by one of their own race to everlasting shame.

The original editions of these tracts are found in the Library of Congress, which possesses also manuscript copies of three extensive histories of the Indies (as Spanish America was then called) from his pen, hitherto unpublished, except in part. Sets of the early-printed tracts have sold from $45 to $100 during the last few years.

The *Cronica de la Nueua España*, by Lopez de Gomara, appeared at Caragoça in 1554. It contains a detailed account of the Aztec people, their customs, religion, wars, and government. The *Historia de Mexico* of Gomara, printed at Anvers, 1554, is in the Library of Congress.

An English translation of Gomara appeared at London in 1578, under the title, *The Pleasant Historie of the Conquest of the West India, now called New Spayne*, and this is also in the Congressional Library. Its auction value in the last ten years has been from $18 to $57.50.

In 1558 appeared, at Paris, André Thevet's *Singvlaritéz de la France antarctique, avtrement nommée Amérique.* The copy in the Library of Congress bears the date 1557, and abounds in quaint and curious woodcuts of the Canadian Indians and their employments. Thevet was translated or paraphrased in English, London, 1568, under the title *The new-found worlde, or antarctike.*

In 1565 appeared at Venice Girolamo Benzoni's *Historia del Mondo Nvovo*, the narrative of an Italian traveler, who devotes much space to the aborigines of Spanish America and the West Indies. It is regarded as a work of fidelity, and gives some of the earliest pictures of savage life which have come down to us. Its price, owing to the large number printed, rarely exceeds $15.

In 1590 appeared the first part of the famous *Grands Voyages* of De Bry, containing Hariot's Virginia, in Latin, entitled *Admiranda narratio fida tamen; de commodis et incolarvm ritibvs Virginiæ; Francoforti ad Moenvm*, 1590. This work is full of quaint and graphic descriptions of Indian life and manners in the sixteenth century. The twenty-eight large plates represent the savages as they appeared in their councils, hunting, games, religious ceremonies, etc., and are engraved in the highest style of copper-plate illustration. So striking and beautiful are they, that they have been reproduced in very many later books, in reduced form. It brought $220 in 1875 at Menzies' sale; Barlow, 1890, $300; Ives, 1891, $275—indicating its extreme scarcity. The other volumes of De Bry, all of which are rich in description and illustration of the natives of various parts of America, are so rare that no complete set of the eleven volumes has been offered for many years, and would command thousands of dollars.

Lescarbot's *Histoire de la nouvelle France* appeared in its first edition in 1609, followed by re-issues, all in French, in 1611, 1612, and 1618, evincing the great interest in stories of life in the New World. Copies of the first edition sold at 1200 francs in 1878, and at the Murphy Library sale (New York, 1884) at $175. Quaritch of London priced it at £40. The later editions have brought from $80 to $200 each. The English translation, *Nova Francia: or the description of that part of Nevv France which is one continent with Virginia*, London, 1609, has sold from $75 to $110.

Captain John Smith's *Map of Virginia*, which is the title not of a map, but of a book illustrated with a map, appeared at Oxford, England, in 1612. This small quarto of 161 pages is full of matter relating to the Indian tribes inhabiting Virginia. It has no mention of the melodramatic story of Smith's rescue by Pocahontas from a bloody death. This tale first appeared twelve years later in Smith's *Generall Historie of Virginia*, 1624, and is discredited by most careful historians. Complete copies of the work are excessively rare; it was priced by Quaritch at £30, and sold at the Murphy sale (New York, 1884) for $180.

Smith's *Generall Historie of Virginia, New-England, and the Summer Isles* (Bermudas), London, 1624, was priced by Henry Stevens in 1862 at ten guineas; at the Field sale (New York, 1875) it sold for $147.50. The second edition, 1627, has sold from $120 to $210, and the third edition, 1632, at $230, in the Brinley sale, 1879.

But large-paper copies of the first issue of 1624 have brought much higher prices: Henry Stevens sold one in 1874 to George Brinley at $1275, and the same copy at the Brinley sale (1878) was sold to C. Vanderbilt for $1800. A still more extravagant price was realized in 1893 at a London book-sale, namely £605, or about $3000. These figures afford a comparative study in book-buying economics, where very much depends upon condition and completeness. Copies of this same book, with text perfect, but wanting one or two of the plates or maps, have sold from $70 to $150. And by way of contrast, I may note that in 1686, at the sale of Dr Bernard's library in London, a good copy of Smith's *Virginia* brought only 4s. 2d.

One of the most notable of French accounts of the Indians is the Sieur de Champlain's *Voyages de la novvelle France occidentale dicte Canada*, the first edition of which appeared in 1613, and the only complete one in 1632. It gives the earliest full accounts that we have of the Indians of New York state, one of whose notable lakes will perpetuate Champlain's name. A still earlier booklet by him, entitled *Des Savvages; contenant les moeurs, façon de vivre, mariages, guerres et habitations des Sauuages de Canada*, appeared in 1604, and is the rarest of all his works. The edition of *Voyages*, 1632, valued by Stevens in 1862 at seven guineas, and by Quaritch in 180 at £695, was sold at the Brinley sale in 1880 for $280. Paris catalogues price copies at 2000 francs.

Raphe Hamor's *True Discourse of the Present Estate of Virginia: with the christening of Powhatan's daughter and her marriage with an Englishman*, appeared at London in 1615. Although a little tract of only 78 pages, this excessively scarce book, of which the sale of only three copies in this country is recorded, brought $150 at auction in 1870, and $270 in 1875. In 1890 a copy in the Barlow sale realized $300. The book contains very minute and trustworthy accounts of the Virginia tribes, by one of the earliest observers, and is much prized.

Father Sagard Théodat, a Recollect missionary among the

Hurons of Canada, published at Paris in 1632 an elaborate work on the Indians, with a dictionary of the Huron language. Its title is thus translated: *The Great Journey to the country of the Hurons in America, upon the fresh water sea ; of the manners of the native savages, of their government and their habits of life, their faith and belief, their councils and wars, their marriages and rearing their children ; of their dances and songs ; of hunting and fishing ; of their mourning, tears and lamentations, and how they shroud and bury their dead.* Auction prices for this book have ranged from $57.50 in 1879 to $170 in 1884.

Another work of Sagard Théodat, *Histoire dv Canada, et voyages que les freres Mineurs Recollects y ont faicts pour la conuersion des Infidelles*, appeared in 1636. This much rarer work brought $225 in 1884, and $450 (or just double) at a Boston auction in 1899.

The famous *Relations of the Jesuits*, issued annually from 1632 to 1673, from the press of Cramoisy in Paris, constitute by far the most extensive and valuable of early records relating to the Indians. All of these forty volumes are rare, and the dingy little sixteen-mos bring from $50 to $150 each when they occur for sale. Complete sets are extremely few, and it took forty years to gather them all for the Lenox Library, which is said to have the only full collection in America. The Congressional Library has thirty-one of the forty, but will doubtless possess them all in time, as Congress is beginning to take larger views of what a national library which truly represents America should be. Our rule of selection at prices deemed reasonable has become, "We want everything in Americana which we have not got," and with continual searching of all catalogues of auctions and of books offered in America and Europe, very little that comes into the market escapes the vigilant scrutiny that is exercised.

Regarding the *Jesuit Relations*, while there are paramount reasons why the originals should be possessed by such a library, the world is now supplied, by American bibliographic and publishing enterprise, with a complete and annotatered production of the *Jesuit Relations*, with many allied documents added, and an English translation of all, printed side by side with the original French or Latin texts. This great boon to students of the literature relating to the Indians is now complete in 73 octavo volumes, edited by librarian R. G. Thwaites, of the Wisconsin State Historical Society, aided by competent translators, and published by the Burrows Brothers Company, at Cleveland, Ohio, between 1896 and 1901. Such a truly monumental work merits the gratitude and the patronage of all library collectors.

A very scarce book in Indian linguistics is the 1643 edition of Roger Williams' *Key into the Language of America: or, An help to the Language of the Natives in New England: with briefe observations of the Customes, Manners and Worships, &c. of the aforesaid Natives, in Peace and Warre, in Life and Death.* The Congressional Library's copy cost $55 at the Brinley sale in 1881; other copies, Field sale (1875), $79, Murphy sale (1889), $77, and Barlow sale (1890), $160; priced by Quaritch, £45. This is believed to be the first work ever printed relating to the Indians of New England, or to their language.

What are known as the "Eliot Tracts," because about half of them were written by the Reverend John Eliot, are eleven small quarto volumes, with quaint title-pages, setting forth the progress made in the conversion of the New England savages to the Christian faith. They began with *New Englands First Fruits*, in 1643, and ended with *A brief narrative of the progress of the gospel amongst the Indians*, in 1671. Complete sets are very difficult to find, though the Library of Congress and two or three other libraries have all. Copies sell at from $30 to $150 for each tract, when reaching the auction room, according to relative scarcity and condition.

The long-vexed question of the actual origin of the Indians of America has given birth to many treatises, among which the earliest in our language is Thomas Thorowgood's, entitled *Iewes* *in America; or probabilities that the Americans are of that race.* This appeared in 1650, and was answered in 1652 by Hamon L'Estrange, in a tract entitled *Americans no Jews.* The little work of Thorowgood has sold at $22.50 to $32 in recent years.

A quite rare book, and a very early one, descriptive of New York under the Dutch domination, is A. van der Donck's *Beschryvinge van Nieuvv-Nederlant*, published at Amsterdam in 1655. This book of one hundred pages has much about the Indians and the inhabitants of New Netherlands, as New York was then called. Most copies lack the map, or have it only in facsimile. Perfect copies have brought from $55 to $190 during the last twenty-five years.

I now come to the rarest of all rare Americana connected with the Indians—the Holy Bible translated by John Eliot into the Indian language, printed at Cambridge, Massachusetts, during the years 1661 to 1663. This early typographical monument was an achievement which, in view of the age in which it appeared, in the infant Massachusetts colony, may fitly be called marvelous. Mr Pilling devotes thirty-two closely printed double columns to it in his *Bibliography of the Algonquian Languages*, and his account (in which he was aided largely by Mr Wilberforce Eames of the Lenox Library) is the fullest and most accurate that is anywhere to be found. The labors of this devoted missionary, who was fitly called "the Apostle to the Indians," are worthy to be held in everlasting remembrance. He dedicated the years of his long life, dying at eighty-six, to the service of evangelizing the Indians. Not only the Bible, but Indian catechisms, Indian primers, Indian grammars, and translations of English works of piety and devotion came from his prolific pen, and were disseminated through the Cambridge press, in numerous editions, among the dusky children of the forest. Of his Indian Bible, no fewer than 1040 copies were printed of the 1663 edition; and when it grew scarce after twenty years (many copies being destroyed in the Indian wars, or worn to pieces in the hands of readers), the second edition (2000 copies) was put to press in 1682, and appeared in 1685. Eliot had only three co-laborers in getting the work into print, one of whom, James Printer, was a native Indian, who, he says, was "the only man able to compose the sheets and correct the press with understanding." The book was dedicated to "the Company for the propagation of the Gospel to the Indians in New England and parts adjacent in America," which had furnished sums amounting to £9000 toward the cost of publication. The venerable translator wrote to them: "The last gift of £400 for the reimpression of the Indian Bible doth set a diadem of beauty upon all your former acts of pious charity. . . As for the sending any numbers of Moses's Pentateuch, I beseech your honours to spare us in that; because so many as we send, so many Bibles are maimed, and made incomplete, because they want the five books of Moses."

Of this precious bibliographical rarity only thirty copies of the first edition and only forty-two of the second are known to exist in America, and a large share even of these are imperfect copies. Only nine copies of the first edition and twelve of the second have been traced in the public and private libraries of England and the continent. Among the American owners are the Library of Congress, New York Public Library, Boston Public and Athenæum Libraries, Harvard University, American Philosophical Society and the Library Company of Philadelphia, Dartmouth College, New York Historical Society, New York State Library, Pennsylvania Historical Society, C. Vanderbilt and J. P. Morgan of New York, L. Z. Leiter and Bishop Hurst of Washington, and Edward E. Ayer of Chicago. There is no room to enumerate the many varying prices at which copies have been sold, which have depended more upon condition and completeness than upon any other standard. Mr Astor paid £225, in 1884, for one now in the New York Public Library. In 1864 a copy brought $825 at the Allan library sale. In 1868, $1130 was paid at the Bruce library sale, $1050 at the Rice in 1870, $900 in 1875 at the

Menzies, $900 at the Brinley sale in 1881, and $1050 at the Cooke sale in 1883. The Library of Congress copy, which is perfect and in the original binding of 1663, cost $700. The highest price yet realized was £580, for an unusually fine copy, bought from Quaritch in 1888 by C. H. Kalbfleisch, of New York. All these prices were for copies of the earliest edition. The second (1685) brought $500 in 1879, $140 in 1882 (wanting six leaves, supplied in facsimile), and $590 in 1881.

The second edition in the Library of Congress came with the Peter Force collection, purchased in 1867, and lacks ten leaves at the end. It is marked $30 on a fly-leaf, and is probably the copy sold at that price in a Boston sale of G. F. Guild's library, as far back as 1853.

No copy of Eliot's Indian Bible has been sold at auction for about twenty years—another evidence of its extreme scarcity. A copy of the New Testament, bound separately, sold for $610 at the Barlow sale in 1890.

George Alsop's *A Character of the Province of Maryland; also a small treatise on the wild and naked Indians (or Susquehanokes) of Maryland, their customs, manners, absurdities, and religion*, which saw the light in 1666, at London, is a highly curious work, classed among the books most difficult to procure.

One of the most curious of the early books having an account of the Indians is John Josselyn's *New England's Rarities discovered; also a perfect description of an Indian Squa, in all her bravery; with a poem not improperly conferred upon her*. This came out in London in 1672. It has brought at American auctions from $35 to $50, if in good preservation.

Daniel Denton's *Brief Description of New York, formerly called New Netherlands: likewise a brief relation of the customs of the Indians there*, appeared in 1670, and is to be classed among the *rarissimi* of Americana. I can trace the sale of fewer than half a dozen copies in a century past, though it has been sought by hundreds of book collectors, and sought in vain. The two reprints of the book, both in 1845, one by William Gowans, in his *Bibliotheca Americana* (limited to 100 copies), and the other by the Historical Society of Pennsylvania, have become rare. Although Henry Stevens, in 1862, priced a copy (probably imperfect) at ten guineas, this little tract of only 21 pages, plus two leaves, brought $220 at the Menzies library sale, 1875. It was sold at the Brinley sale at $385 in 1880, again in 1889 for $520, and for $615 at the Brayton Ives sale in 1891; and £400 was paid for it by some hungry and enthusiastic American at a London auction in 1900. This was the high-water mark for Denton's curious volume, and a copy has been sold the present year in London for £75. It is a curious fact that nearly all the copies found have the date of publication cut off in trimming the book, and an uncut copy is, I believe, unknown. The copy in the Library of Congress has the text perfect, but the title-page and the following leaf are partly in facsimile.

William Hubbard's *Narrative of the Troubles with the Indians in New England, from the first planting thereof to the year 1677*, appeared from John Foster's Boston press in 1677. With the genuine map (very rare), copies have brought from $180 in 1870 to $550 in 1896, showing the increasing rarity of perfect copies. Reprints of Hubbard are quite abundant.

One of the rarities of the French press is Le Clercq's *Premier Établissement de la Foy dans la nouvelle France*, in two volumes, Paris, 1691. This work, by a Recollect missionary, is replete with descriptions by an eye-witness of the life and character of the Indians. It has sold at auction from $160 to $210.

Gabriel Thomas's *Historical and Geographical Account of Pennsylvania and West New Jersey in America* appeared at London in 1698, and will close my notices of early books having to do with the Indians, published before 1700. Copies with the original map are so scarce as to have brought from $100 to $200 at auctions occurring between 1875 and 1891.

SUMMARY OF THE ARCHEOLOGY OF SAGINAW VALLEY, MICHIGAN

By HARLAN I. SMITH

INTRODUCTION

Saginaw valley, including the entire area draining into Saginaw bay, occupies the east central region of the southern peninsula of Michigan. It is a well-watered, level, timber country, formerly covered by dense forests of pine, oak, elm, ash, maple, hickory, and other trees. The low-lands are occupied by swamps which in places are largely grown up with wild rice (*Zizania aquatica*), a staple produced by nature in such abundance that it was of great importance to the primitive people of the region when they were first met by the whites.[1]

The streams which most concerned the prehistoric inhabitants of the valley were Saginaw river and its main tributaries including the Shiawassee, Flint, Bad, Cass, Tittabawassee, and their branches; while the Pigeon, Sebewaing, Kawkawlin, and Rifle were also important. Bordering the lower courses of the river, are numerous bayous; interspersed over the intervening country are low sand ridges. At the headwaters the streams flow more swiftly and undercut their banks because their beds have greater fall, consequently large bayous and swamps are less frequent.

Rocks of the subcarboniferous series, bearing chert nodules, outcrop in a nearly circular line cut by the headwaters of the Cass, Shiawassee, and Tittabawassee, and intersecting Saginaw bay near Point Lookout and Bay Port. This chert was extensively quarried and chipped into implements by the prehistoric occupants of the valley.

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[1] Stickney (Gardner P.), "Indian Use of Wild Rice," *American Anthropologist*, Washington, vol. IX, No. 4, April, 1896, pp. 115–121, pl. 2. Copies: University at Ann Arbor.

When the whites first visited this region it was inhabited by the Ojibwa Indians, whose descendants preserve traditions of its occupancy by the Sauk.[1] One of these traditions[2] states that the latter were expelled by the Ojibwa and their allies.

The Indians were found to subsist on a variety of natural products, chief among which were wild rice, maple sugar, squash, corn, wild fruits, and game. The villages were located along the streams, probably because of the importance of water, wild rice, fish, and the animals which frequented the river banks for food or visited them for water. The canoe was an easier means of transportation than the trail, and even trails were more easily formed along the ridges parallel to the rivers or along the banks than elsewhere. The outcrops of chert and pipestone are exposed by the rivers cutting through them, while in other places they are covered with soil. From them the canoes could easily descend to villages along the rivers, while to carry the material by trail to inland settlements would be difficult.

The evidences on the extensive village sites and in the burial places, mounds, and other remains along the streams suggest that the conditions of life in prehistoric times were similar to those which existed when the Indians were first met by the whites.

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[1] In a personal letter, dated Frederick, Md., Dec. 26, 1896, Prof. Cyrus Thomas writes: "The people of this tribe have been designated by such terms as Asaukees, Jakis (misprint for Sakis), Osagi, Osak, Osankies, Osaugeeg, Osaukies, Osaukee, Ousaki, Ousakiouek, Ozaukie, Sagaeeys, etc. Tradition points to the east or north of Lake Huron as their former home. They stopped for a time, on their westward journey, near Saginaw bay, which received its name (Saukee-nong, 'Sac-place') from this circumstance. According to Bela Hubbard (*Memorials of a Half-Century*, p. 159) Champlain [1611–12] 'visited the country of the Sacs near Saginaw bay.' See also Schoolcraft, *Ind. Nats.*, V, p. 145." Hubbard (Bela), *Memorials of a Half-Century*, New York, c. 1887; Schoolcraft (Henry R.), *Historical and Statistical Information Respecting the History, Conditions, and Prospects of the Indian Tribes of the United States*, Phila., 1851–57, pts. I–VI, 4°. Copies: University, Hoyt, Saginaw.

[2] The tradition is recorded, as related by William McCormick, on pp. 117–120, of *History of Saginaw County, Michigan*, Chicago, Chas. C. Chapman & Co., 1881. See also Smith (Harlan I.), "Legendary Invasion of the Saginaw Valley," *American Antiquarian*, Chicago, vol. XIII, No. 6, Nov., 1891, pp. 339–340; reprinted under title "The Invasion of Saginaw Valley: A Legend of Northern Michigan as Told by an Indian," *Detroit Free Press*, Sunday, January 3, 1892, p. 11; also in *Saginaw Courier-Herald*, January 7 and 14, 1892.

This paper aims primarily to summarize all the available data, with references to every source of information; to publish original manuscript and other material not generally accessible; to include all clues and rumors, however vague, which might lead to further knowledge, and to classify all in order that the summary may serve the purpose of a field library for ready reference in acquiring and recording further data on the subject, not only by field workers but also by local students far from the sources of information. It is hoped that those having any item, however brief, which may be added to this summary, will publish or report it.

The writer's personal contribution is based on observations and a collection begun in 1883. Most of the latter resulted from personally conducted explorations which during the time noted necessarily dealt chiefly with surface evidence. With the exception of a few objects and certain specimens presented to the Peabody Museum of Harvard University, the University of Pennsylvania, the Smithsonian Institution, and the American Museum of Natural History, this collection is deposited in the museum of the High School of Saginaw, Michigan. Specimens and field assistance were received from many, to whom, in each case, credit is given in the text describing the particular specimen or locality.

SAGINAW BAY; EASTERN SHORE

HURON COUNTY

Coast Mounds. — Professor Thomas[1] states that there are "mounds along the northern coast, especially between Port Austin and Pointe Aux Barques, also between Grindstone City and Huron City. Reported by Gerard Fowke."[2]

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[1] Thomas (Cyrus), *Catalogue of Prehistoric Works East of the Rocky Mountains*, Washington, 1891, p. 110. Copies: University.

[2] Mr Gerard Fowke, of Chillicothe, Ohio, made a reconnoissance of Michigan for the Bureau of American Ethnology.

Mr Fowke[1] credits this information as from Dr G. A. Stockwell[2] and states that "there are mounds around the entire coastline of the county; many between Port Austin and Pointe Aux Barques and also between Grindstone City and Huron City." He also states that "oval or oblong, low, flat mounds" are meant.

Caseville Mounds. — Professor Thomas[3] states that there is a "large circular work in Caseville township on a small stream emptying into Wild Fowl bay, 5 miles southwest of Caseville. Reported by Gerard Fowke."

Mr Fowke[4] credits this information as from Dr G. A. Stockwell and as relating to "large circular mounds." The stream is probably Mud creek. The region near the eastern shore of Wild Fowl bay is low, with an occasional sand ridge, and is less than eight miles north of extensive outcrops bearing chert nodules.

North Island Workshops.[5]— At the western limit of Wild Fowl bay is North island, on the northern side or highest part of which are traces of workshops where chert implements may be found in all stages of manufacture — from the nodular masses occurring in the substratum of the entire island to the finished chipped points for spears, arrows, knives, and similar objects. Chipped implements of other material have not been obtained at this place.

Heisterman Island Village Site. — Lying next south of North island, at a distance of about a mile, is Heisterman island, where are many traces of an ancient village site in addition to evidences similar to those on North island. These are on the sand ridges —the highest land—and on the northeastern side of the island[1] where it slopes to the marsh lands known as the Middle Grounds. These swamps are especially frequented by fish, and wild fowl assemble there in great numbers to feed on the wild rice. The rice alone, which does not grow off other portions of Heisterman island, may have determined the site of the prehistoric village. The subcarboniferous series underlying the island outcrops on its western shore, within easy access of this site. Hammerstones, chipped points for arrows, knives, spears, drills, etc., and chipped implements resembling flint hoes in shape, have been gathered here. Fragments of pottery, many of which are neatly ornamented (some by incised designs, others by cord impressions) and a fragment of a pottery pipe have also been found at this site. Assistance was rendered in collecting at this place by Miss Edith Newton of Saginaw.

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[1] Copy of Fowke's *Report on Michigan.* A carefully compared copy made with permission of Professor Thomas from a copy made by Rev. Wm. M. Beauchamp, of Syracuse, N. Y., for his use while assisting in preparing the Thomas *Catalogue.*

[2] Dr G. Archie Stockwell, then of Port Huron, Michigan, while hunting extensively in various parts of the state, had been watchful for mounds or other remains. He desired to make a systematic survey of Huron county and had collected many data regarding Michigan archeology which he freely offered to place at the disposal of students. In 1894 Dr Stockwell removed to Detroit, Michigan.

[3] Thomas, *Catalogue*, p. 109.

[4] Fowke, *Report on Michigan.*

[5] Frac. secs. 21, 22, 27, and 28, T. 17 N., R. 9 E.

Mai-sou Island Mounds.[2] — Professor Thomas,[3] referring to his preceding note on the Caseville mounds, states that there are "several similar mounds on Mason island southwest of Wild Fowl bay. Reported by Gerard Fowke."

Mr Fowke[4] credits this information as from Dr G. A. Stockwell and as referring to "large circular mounds."

Bay Port Village Site.[5] — A village or camp was located on the mainland and lay along the sand ridge which runs parallel to the beach of Wild Fowl bay at a distance of a few hundred feet; it extended at least half a mile to the east from the wharf at Bay Port. Chipped implements of chert in all stages of manufacture are frequent on the ridge. Potsherds, a gorget, one grooved maul, and a paint grinder were also found here. Assistance was rendered in collecting from this site by Mr Ralph C. Smith of Saginaw, and by Mrs P. C. Smith and Miss Anna Smith of Bay Port.

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[1] Frac. Secs. 28 and 29, T. 17 N., R. 9 E.

[2] Mai-sou or Kate Chai island, about half a mile southwest of Heisterman island, Frac. Secs. 5, 7, 8, 17, and 18, T. 16 N., R. 9 E.

[3] Thomas, *Catalogue*, p. 110.

[4] Fowke, *Report on Michigan*.

[5] Frac. S. E. of N. W. and S. W. of N. E. Sec. 36, T. 17 N., R. 9 E.

Bay Port Cache.[1]—A cache consisting of one cross-section of a chert nodule and forty-seven "turtle-back" blanks, was found two feet below the surface in the muck jungle about 100 feet from the shore of Wild Fowl bay and a quarter of a mile east of the wharf at Bay Port.[2] The specimens in the cache were found in a row, overlapping one another somewhat like shingles on a roof. It is probable that the material of which they were made was obtained near the spot, as the outcrop of subcarboniferous rock, which occurs for some distance along the beach westward from the wharf, bears concretions the material of which is similar to that of the cache specimens. There are several outcroppings of this rock within a mile. In this cache were blades of peculiar form, having a straight, beveled edge on one side. It seems probable that this was caused by flaking the pieces for "turtle-backs" from a round concretion. The first flake removed would be perfect, but after that, if the material were used without waste, each flake would have one side beveled where the immediately preceding flake had been removed from the nodule. They had not all been subjected to sufficient secondary chipping to remove the signs of this bevel.[3] The specimens were found by Mr Frank Lawrence, of Bay Port, on the land of Hon. William L. Webber, of Saginaw, who preserved and presented them to the writer.

Sharpsteen Village Site.[4]—A camp or small village was located on Sharpsteen point, about half a mile west-southwest of the Bay Port village site. It was on a wide sand ridge of slight elevation. Potsherds, hammerstones, and chipped implements were numerous on the surface. A celt in process of manufacture was also found here.

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[1] Smith (Harlan I.), "Caches of the Saginaw Valley, Michigan," *Proc. Am. Ass'n. Adv. Sci.*, vol. XLII (1893), 1894, pp. 300–303 ; also reprint, 4 pp. Copies: University, Hoyt. See also the same article revised and extended in *The Antiquarian*, Columbus, Ohio, vol. 1, pt. 2, Feb. 1897, pp. 30–33.

[2] Frac. S. E. of N. W. Sec. 36, T. 17 N., R. 9 E.

[3] See also Cass cache No. 2.

[4] N. W. of S. E. Sec. 35, T. 17 N., R. 9 E.

Sebewaing Village Site.[1]—A camp or small village was situated on the south side of Sebewaing river and back from the flood-land which here extends along the shore of Saginaw bay. It lay upon a low sand ridge near the first shaft of the Sebewaing Coal Company. Chipped points of chert, potsherds, and burned and crackled pebbles have been found in sufficient numbers to indicate the site. In a reconnoissance of this place assistance was rendered by Prof. Israel C. Russell, geologist of the University of Michigan at Ann Arbor.

Pigeon River Mounds.—Professor Thomas[2] states that "large circular mounds at the head of Pigeon river, near the middle of the southern boundary of the county" are "reported by Gerard Fowke." Mr Fowke[3] credits this information as from Dr G. A. Stockwell.

Bad Axe Earthwork.—Professor Thomas[4] states that "Bad Axe post-office is on a circular mound or earthwork in a swamp," as "reported by Gerard Fowke." Mr Fowke[5] credits this information as from Dr G. A. Stockwell and as relating to "a spot of dry land twenty or thirty feet above the level of the swamp, with a wall of earth extending around it."

For further references to the archeology of Huron county, see under Cass River Valley, to follow.

TUSCOLA COUNTY

Unionville Mounds.—Professor Thomas[6] states that there are "mounds in Geneva township, on Saginaw bay, 3 miles north of Unionville. Reported by Gerard Fowke." Mr Fowke[7] credits this information as from Dr G. A. Stockwell and states that " oval or oblong, low, flat mounds " are meant.

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[1] S. W. Sec. 8, T. 15 N., R. 9 E.
[2] Thomas, *Catalogue*, p. 110.
[3] Fowke, *Report on Michigan.*
[4] Thomas, *Catalogue*, p. 110.
[5] Fowke, *Report on Michigan.*
[6] Thomas, *Catalogue*, p. 115.
[7] Fowke, *Report on Michigan.*

Squaw Creek Earthworks.—Professor Thomas[1] states that there are " earthworks (explored) on Square creek, in Akron township. Reported by Gerard Fowke." Mr Fowke[2] gives the name as Squaw creek and credits this information as from Dr G. A. Stockwell who reported the earthworks but had not seen them himself.

Quanicassee Earthworks.—Professor Thomas[3] states that there are " mounds and earthworks on Quanicassee creek. Reported by Gerard Fowke." Mr Fowke[4] credits this information as from Dr G. A. Stockwell who reported to him but who had not personally seen the remains. He also states that " oval or oblong, low, flat mounds " are meant.

For further references to the archeology of Tuscola county, see under Cass River Valley, to follow.

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[1] Thomas, *Catalogue*, p. 115.

[2] Fowke, *Report on Michigan.*

[3] Thomas, *Catalogue*, p. 115.

[4] Fowke, *Report on Michigan.*

MUMMIFICATION, ESPECIALLY OF THE BRAIN

By D. S. LAMB

Egyptian and Peruvian cemeteries have supplied our museums with the mummified remains of those who died hundreds and even thousands of years ago. The motive for this mummification was mainly a religious one — a looking forward to a time when the body would need to be in actual evidence, lest in its absence dire disaster should befall the individual.

The story of embalming as practised by the Egyptians has been told by Herodotus, Diodorus Siculus, and many other writers, who have also described the processes used. These latter varied with the financial, social, and political status of the deceased; the circumstances of the death, including sometimes the necessity for haste in preparation for burial; the conscientiousness of the funeral director and his assistants, which was of course a variable quantity then as now; and for other reasons.

The Egyptians practised embalming from about 4000 B.C. to about 700 A.D. Everybody was embalmed—old and young, male and female, strangers and criminals,—and also many of the lower animals. Herdman[1] states that over 200,000 mummified animals were brought to Liverpool in 1890 and sold as fertilizer; these were mostly cats, from the great cat cemetery of central Egypt, Beni-Hasan, where formerly was a celebrated temple to Pasht, the Cat-goddess.

The substances used for embalming by the Egyptians need not be mentioned further than to say that all the aromatics of which they had knowledge were used, except frankincense, which for some reason was forbidden; bitumen, which was comparatively inexpensive, was used particularly for the poor, and we are told that these bitumen-preserved bodies have in later days been used largely for fuel.

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[1] *Proc. Liverpool Biolog. Soc.*, 1889–90, IV, pp. 95–96.

We are more interested in the methods employed. The brain was usually, but not always, removed. The operator first broke down the fragile bones of the roof of the nose or, exceptionally, at the back of the orbit, by means of an iron rod with a hooked end, and then withdrew the brain in fragments either with or without its membranes; sometimes he used a stream of water to facilitate the removal. He afterward introduced into the skull cavity a preservative, usually one of the aromatics, sometimes bitumen, (the so-called *asphaltum* of the Egyptians). As much as two pounds of preservative have been found in one skull.

Prof. Alexander Macalister,[1] an eminent English anatomist and anthropologist, who had a large collection of mummied heads, stated that in fifty-six percent of them the brain had been extracted through the nose, and nearly twice as often through the left nostril as the right; sometimes the nasal septum was broken; twice the brain had been removed through the orbit; in some cases the membranes had been removed, in others, not. In general the operation had been only imperfectly done. In a few cases not only preservative material but also bandages had been introduced into the skull-cavity; Professor Macalister drew four yards of bandage from one nose; in another case the cavity was filled with rags. Twenty skulls had been filled with bitumen through the nose. Dr Garson[2] stated that in a series of twenty-three skulls of the fourth dynasty obtained by Flinders-Petrie from Medum, the brain had not been removed. Pettigrew,[3] mentioned that in the mummy of Kannopis the brain was found lying, in a cake-like mass, in the back part of the skull-cavity, having the impress of the bony ridge at the back of the cavity, showing that the body had been placed in a horizontal position after embalming. He had another head from Thebes showing the same thing.

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[1] *Jour. Anthrop. Institute*, XXXIII, 1893–94, pp. 115–126.

[2] Ibid.

[3] *History of Egyptian Mummies*, London, 1834, pp. xxi, 56.

Several authors have mentioned the possibility of removing the brain through the foramen magnum. Czermak suggested this, and what seemed to him to corroborate it was that the mummies from Thebes usually showed the ethmoid bone broken down, but those from Memphis only rarely. In a letter to Virchow, dated Cairo, February 21, 1897, Fouquet[1] mentioned finding resinous material in a skull at El Omra, but as the skull had not been perforated, the only apparent way by which the brain had been removed was by the occipital foramen. He thought, however, that this could not have been done without first cutting off the head. Virchow, commenting on Fouquet's letter, remarked that Fouquet had also unwrapped more than a hundred priest mummies of Deir-el-Bahari, (twenty-first dynasty,) in which the brain had been removed by perforating the ethmoid bone and washing out with a stream of water. Virchow had himself examined mummy skulls by coronal section which showed the destruction of the ethmoid and adjacent bones, the injury in some cases being quite extensive. He doubted if in mummies the brain had ever been removed through the spinal canal or foramen magnum, because such an operation would be attended with the greatest technical difficulties and would hardly be attempted even at the present day. Whether the masses so often found in mummy skulls are or are not brain which has dried and become changed in some thousands of years, he considered to be an open question.

There is also a letter to Virchow from Dr G. Schweinfurth,[2] dated Assuan, February 18, 1897, in which he remarked that in Peru the bodies were never exposed to rain; but in Abydos, Egypt, where burials were made without wrapping the body and without coffin, rain certainly did occur at intervals of every eight or ten years, as shown by the incrustations of salt on the skulls. Abydos was the location of the first dynasty; it was six miles from the west bank of the Nile and a hundred miles below Thebes. The modern name of the village is Arabat-el-Madfoon, also called Madfuneh.

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[1] *Verhand. Berlin. Gesell. f. Anthrop.*, 1897, p. 134.

[2] Ibid., p. 131 et seq.

Salkowski[1] reported to the Berlin Anthropological Society the results of his most exhaustive examinations of the contents of some Egyptian mummy skulls, in which investigation he was assisted by Dr Georg Schrader. The masses were found to be usually dark brown, were somewhat friable, and broke with a shining fracture; he obtained from them an alkaline ash, salts of phosphoric acid, resinous matter, fatty acids, and neutral fats which always gave a strong reaction of cholesterin. His conclusions were that in some cases brain matter was probably present, in others its presence was doubtful; from which Virchow was moved to question whether the material was actually brain or merely embalming material.

Of the thousands of Egyptian mummies examined in modern times, there is, so far as I know, but a single record (that of Flinders-Petrie and Quibell[2]) of the undoubted finding of a brain—proved to be such by the preservation of its convolutions. The burial is classed by Petrie as a contracted burial of what he calls the "New Race"; that is, the race which went into Egypt during the period between the sixth and twelfth dynasties. The cemetery was near Ballas, on the west bank of the Nile, about thirty miles north of Thebes. The period[3] is estimated to have been between that of the Old and Middle Kingdoms, 3300 to 3000 B.C. In the language of the observers, "the body was sharply contracted, the left arm especially being quite doubled. The brain remained in the skull, dried to a dark brown mass, rather smaller than a cricket ball, in which *the convolutions were still clearly defined.* Some fragments of wood were below the body. . . . None of the filling of the tomb had slipped under the cover." [1]

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[1] Ibid., pp. 32–34, 138 et seq.

[2] *Naqada and Ballas*, London, 1896.

[3] Ibid., p. 61.

I would not be understood as saying that this is the only case of the kind recorded, but it is the only one I have been able to find. In view of the fact that it is estimated that about four hundred millions of persons were embalmed in the 4700 years in which the Egyptians practised embalming, it is curious, to say the least, that there would appear to be but one such case recorded.

The most interesting question is, how this brain, an organ so very perishable under ordinary post-mortem conditions, was preserved. The conditions in this case must therefore have been quite extraordinary: the environment must have been exceptionally dry.

The great perishability of the brain is due to the large quantity of water which enters into its composition. The usual attempts to preserve it have therefore been on one of two lines—either by rapid drying or by substituting another liquid for the natural moisture. These other liquids have the quality of chemical constancy under ordinary atmospheric conditions, and some of them cause chemical and physical changes in the brain itself which delay or prevent decay—they are therefore called preservatives. Aside from the religious motive which prompted persons or peoples to attempt the preservation of the brain, this is often desirable in modern times to enable satisfactory study of the differences in the brains of individuals and of races, between those of human beings and the lower animals, and for other purposes.

The usual method by which the Egyptians preserved the remainder of the body was to make an incision in the left side of the abdomen and introduce a preservative into this cavity and the thorax, in most cases previously removing the organs contained in these cavities and treating them also with the preservative, after which they were either replaced or kept in appropriate vessels near the mummy. There is much evidence that the body was kept many days in a solution of bitter salt; and there were many lakes of bitter water in the near-by Libyan desert. The body was finally wrapped in bandages intermingled with preservative substances; twelve hundred yards of 3¼-inch bandage have been unwrapped from a single mummy. The period covered by the entire process is said to have been seventy days, while the cost varied from a small sum to as much as twelve hundred dollars.

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[1] Par. 23, left column of p 15 ; see also pl. v, p. 23.

In view, then, of the great care taken by the Egyptians to preserve the body, we need not be surprised that after hundreds and even thousands of years the features are still natural in many cases. In a discussion before the Anthropological Society of Paris,[1] in describing the face of the mummy of an Egyptian man twenty-four or twenty-five years of age, which was found in a royal sepulcher at Deir-el-Bahari, Fouquet said that the mouth was open, with the left corner raised and the right depressed, while the limbs, like all the rest of the body, were contorted—indisputable evidences of the last convulsions of a terrible agony, even after thousands of years. Fouquet's conclusion was that the man had died in convulsions from poisoning. The brain had been removed through the nose, but no opening had been made in the side of the body; the embalming had not been regular, and the bandaging evidently had been hurried. Here, then, was a case of medico-legal importance in which the evidence was still present after several thousand years.

J. C. Warren[2] described an Egyptian mummy in which there was a distortion of features from right to left, such as we see in facial paralysis. Other writers mention the natural appearance of mummies; especially Maspero[3] in his description of the mummy of Seti I, father of the great Rameses II, 1300 B.C. A similar statement is made in regard to Rameses himself[1]; and Maspero mentions also a mummy of the sixteenth dynasty, 4000 to 6000 years old, in the great museum of Poulak, in which the features are still natural.

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[1] *Bulletin*, etc., 1886, IX, p. 582.

[2] *Jour. Phil. and Arts*, Boston, 1823-24, I, pp. 164, 269, 2 pls.

[3] *Sanitary World*, London, 1886, VI, p. 5.

The excellent preservation of the tissues of these mummies is also shown by microscopical examination. Thus, Czermak[2] reported that the nails showed nuclei; the connective tissue, spindle-cell nuclei; the muscle fibers, striation; the cartilage showed cells; nerve fibers showed the axis cylinder, and fat cells were recognizable. He gave illustrations of all these. Maddox[3] also was able to recognize, microscopically, muscle and nerve fiber in a mummy.

The Guanches, the aboriginal people of the Canary islands, practised what was mainly a dry-air method of preservation. The bodies were sewn in skins and deposited in grottoes; after 2000 years they are in good preservation. Here may be mentioned Dalrymple's report[4] of two bodies preserved by resins in lead coffins in an abbey vault.

Turning to the Western hemisphere we find that the Incas mummified their dead, and are said also to have embalmed the bodies of persons of high rank, although the process of embalming was apparently nothing more than drying by heat. The bodies were usually doubled up in a sitting posture and wrapped in a number of coverings, intermingled with various articles, as coca and other leaves, wheat and other stalks, and raw cotton; and the entire mass was tied with cords. The preservation depended on the absence of rain, the consequent dryness of the earth, and the quantity of niter which the earth contained. The bodies were placed in graves from 2 to 15 feet deep; sometimes the grave was lined with a stone wall, at others with an adobe wall, but often it was simply a round or square opening made in the hard earth. Some graves had a roofing of reed cane, some of adobe, but oftener there was only a sand filling. The body was usually placed with the back to the east. It is stated by Parish[1] that in many cases the eyes of cuttle fish were substituted for the natural eyes of the individual.

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[1] *Uncovering of the Mummy of Rameses II*, folio, Boston, 1886.

[2] *Beschreibung und mikroskopische Untersuchung zweiter Aegyptischen Mumien.* Reprinted from October number, 1852, of session of m. n. class. der Kais. Akademie der Wiss., IX Bd., p. 427.

[3] *Jour. Roy. Micros. Soc.*, London, 1887, pt. 4, pp. 537–544, pl.

[4] *Med. Quart. Rev.*, London, 1835, III, pp. 169–171.

When these mummies are unwrapped the flesh is found to be dry, brittle, and shrunken ; in quite young children it is sometimes reduced to a brown powder, and only portions of the hairy scalp and the cartilaginous coverings of the joints can be recognized, the joints being separated and the bones being in a heap.

In adults the *dura mater*, i. e., the firmer covering of the brain, is generally recognizable as a dry, more or less tough and tenacious membrane, and sometimes its blood-vessels are distinct. The brain itself is usually found either as a loose, shapeless, somewhat flattened mass, or as smaller masses adherent to the several intracranial fossæ, or both. The color varies from light brown to nearly black; it has the consistence, toughness, and brittleness of ordinary resin; in its center is sometimes found a whitish, wax-like substance. The mass usually burns with a dull, smoky flame, like resin, with a blackish residue. The actual weight of the brain in one case was two ounces, probably one-twentieth of its original weight. Professor Vogel, of the University of Giessen, examined many of these masses, and reported that chemical and microscopical analyses showed them to contain brain fat and dried blood cells, with no foreign substance.[2] Dr W. M. Gray of the Army Medical Museum at Washington, has also examined these masses microscopically and reports that they dissolve readily in caustic potash solution and are composed of numerous cells varying in shape and size, mixed with unrecognizable granular material, with an occasional small mass of blackish pigment; macroscopically they break like wax and have a greasy feel. Salkowski[1] also examined the skull contents in one case; they consisted of a soft, brownish, friable mass mixed with some sand, and burned with a bright flame and the odor of fat and burning horn. He obtained a fatty mass by extraction with alcohol and also a strong reaction of phosphoric acid, from which he concluded that it was undoubtedly brain substance.

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[1] *Trans. Ethnolog. Soc.*, London, 1866, n. s., IV, pp. 59–60.

[2] *Comptes Rendus Acad. Sci.*, Paris, 1857, XLIV, p. 1204.

In no case have I seen any appearance of convolutions, although Dr G. A. Dorsey of the Field Columbian Museum, Chicago, tells me that he has seen them.

To what extent mummification was practised on this hemisphere I do not know, but I am told that the practice extended from one end to the other. In the Eastern hemisphere embalming was practised by others than the Egyptians, but not to the same extent, and the art was in many cases learned from the latter.

Many isolated instances of mummification are recorded, which, however, were accidental or at least unintentional. For instance, in arid regions the dead body, if not disturbed by predatory birds or beasts, simply mummifies; a similar condition results in the case of those overwhelmed by sandstorms. Human beings and animals imbedded in avalanches of snow, in ice or frozen earth, are preserved, but not necessarily mummified. On the top of the great St Bernard is a morgue in which are placed the bodies of unknown persons perished in the snow, and these bodies dry up. Mummified bodies have been found in the convents of the Capuchins near Palermo and at Rome, in the caves of St Michael at Bordeaux, in the church of St Thomas, Strasburg, in the vault of the Kreuzberg church, near Bonn, on the Rhine. There is also the famous case of the murder of De la Visée and his servant in Paris; the nineteen bodies of soldiers, perfectly preserved, reported by König,[2] and the two bodies in lead coffins, reported by Brébant.[3]

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[1] Loc. cit.

[2] *Pest. Med. Chir. Presse*, Budapest, 1890, XXVI, p. 691.

[3] *Union med. and scient. du nord*, Reims, 1886, X, pp. 290-305.

In some of these cases many years and even hundreds of years had elapsed between the time of death and the discovery of the bodies.

In view of the multitude of Indian mounds in the United States, it might be supposed that there were many instances of mummification; but they have been very rare indeed, compared with the immense number of simply dried bones which have been found. The fact that the bodies were usually committed directly to the earth of course facilitated rapid disintegration as against preservation, and much less mummification. Two instances have been recorded in which the dried brain of an ancient Indian has been preserved with sufficient distinctness to be recognized as such; one by Prof. F. W. Putnam, of the Peabody Museum, Cambridge, and the other by Prof. Warren K. Moorehead. With regard to the former, Professor Putnam[1] says:

> Over the head was a broad piece of copper, extending from ear to ear, and over this a woven net of bark-fiber, outside of which was a braided mat of cedar bark. The action of the copper upon these fabrics and upon the scalp has preserved them, and also the hair and skin under the copper. The bones of the face and portions of the cranium are deeply stained by the copper. Even the interior of the cranium is stained green, and the action of the copper, with the favorable condition of a dry soil, has preserved a portion of the brain mass with its membranes in the form of a hard dark ball. . . . There is little likelihood that the Indian whose head has been so well preserved by the action of the copper covering was buried less than 250 years ago, and the oxidized and decayed condition of the remaining portions of the copper shows that considerable time has elapsed since the burial took place. These interesting objects were found by the workmen on the Winthrop branch of the Revere Beach and Lynn Railroad, in the town of Winthrop, Mass.

The *raison d'être* of this paper is the brain found by Prof. Warren K. Moorehead in a mound, the property of Charles Metzger, on Deer creek, about two miles southwest of Yellow Bud, a post village of Union township, Ross county, Ohio. The mound was on a hill over 150 feet high, was nearly round, and was originally 40 feet high with a base diameter of 200 feet; it was of ordinary hill clay, and had been made entirely by manual labor. The ground on which it was erected had been leveled and burnt, so that it had an even floor.

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[1] 22d Report of the Trustees of Peabody Museum, vol. IV, No. 2, 1888, p. 37; also, 23d and 24th Reports, vol. IV, Nos. 3 and 4, 1891, p. 75.

Some farmers had cut the mound down from 40 to 34 feet and sunk in its center a circular shaft 8 feet in diameter to a log pen; that is, a pen made of logs which supports the overlying earth and conceals a cavity in which are usually a skeleton and other things. There were several log pens in the mound. In one place, about four feet from the bottom of the mound, was a bed of ashes from one-fourth of an inch to 3 inches in thickness, extending over an area more than 10 by 6 feet; the earth beneath the ashes was burnt a bright brick red. Near the edge of this ash bed was the end of a cedar log, 18.5 feet long and 5.4 feet in circumference, that must have been brought from some distance, because there are no cedar trees within ten miles of the mound and no tradition of any. A circle of saplings had been placed about the log somewhat in the form of a tepee. Immediately beneath the log, in an excavation two feet below the original ground surface, was a skeleton, with head to the north, arms at the sides, legs extended. Traces of hair were about the skull; the brain was dried and shrunken within the skull. Cloth, buckskin, rude matting, and bark covered the skeleton, which was discovered September 4, 1894. Professor Moorehead said: "The dry ashes with which the remains were covered and the great depth, 36 feet, from the surface, aided in the preservation of such substances as usually decay."[1]

In reply to inquiries, Professor Moorehead, on November 24, 1900, stated that he personally discovered the "little dried round ball" and removed it from the skull; he did not notice any membranes, and in fact never noticed any in any other skull; but there was some soft, fine, sand-like dirt in this cranium.

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[1] See account by Clarence B. Moore in *Proceedings Academy of Natural Sciences Phila.*, for 1894, pp. 314–321.

Mr Moore[1] says that the Metzger mound contained nothing of European manufacture and may therefore have been many hundred years old; in his opinion it antedated the coming of white men to that part of Ohio. As the French were the first whites to enter this territory (about the year 1670), it seems safe to estimate the age of this brain at not less and probably much more than two hundred years.

I have been thus particular to give the details of the finding of this brain specimen, because Dr M. G. Miller, of Philadelphia, assistant to Mr Moore, in a letter asking if I would care to examine and report upon it, stated that he had written "to Virchow and other continental authorities, but they had never met with or heard of a human brain having been preserved by natural agencies and seemed to doubt the genuineness of the specimen."

The matter seemed to me of enough importance to be referred to the Director of the Army Medical Museum and Library, Col. A. A. Woodhull, who accordingly replied to Dr Miller, offering to have a careful examination made of the specimen, to determine its nature. Dr Miller, in behalf of Mr Moore, formally contributed it to the Museum. He also wrote that in certain crevices of the brain there were particles of a friable, whitish substance; and material apparently similar remained on certain pieces of bone, buckskin, etc., from the same burial.

The specimen as received is in two parts, unequal in size, and with a few smaller fragments. Placed in what seemed their natural apposition, they measure together 4.3 cm. long, 4.5 cm. broad, and 2 cm. thick. The breadth of an average adult recent brain at a corresponding place is three times as great, and the difference represents the extent of shrinkage. The weight is 12.54 grams — less than half an ounce; an average adult's brain weighs about 48 oz. The two parts are rounded anteriorly; the upper surfaces are much flattened, the lower surfaces irregularly flattened; each shows posteriorly an irregular broken surface. Color, dark brown, approaching black externally; a lighter brown or tan color where the outer part is chipped away; the appearance is everywhere granular; in one or two places where the outer part has been fractured, black, glistening surfaces appear beneath. Scattered in crevices in the general surface is a small quantity of a whitish powder. All the surfaces are convoluted and the general appearance is that of a brain; the cerebellum, pons, and oblongata are absent. The above description is practically the same as that given by Colonel Woodhull in his report.

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[1] Op. cit.

Portions of the specimen were examined by Dr Gray, who reported that they almost entirely dissolved in caustic potash, the soft residue not showing any fibrous character. Macerated portions showed cells of various shapes and sizes, consistent with tissue cells. These absorbed analine dyes, but showed no evidence of nuclei. Some cells contained a black or dark brown pigment, undistinguishable from blood pigment, and with these were many small round cells which resembled and may have been red blood cells. No fibrous element was demonstrable. He regarded the specimen as of animal origin and probably brain.

Dr W. M. Mew, chemist, carefully examined the whitish substance associated with the specimen and found it to be phosphatic, indicating osseous or nervous tissue and excluding the possibility of its being vegetable matter.

The specimen, however, was further referred to Mr Albert F. Woods of the Division of Vegetable Physiology and Pathology in the Department of Agriculture, who reported: "We made careful micro-chemic tests as well as microscopic examination of the specimen and cannot find any evidence of the presence of vegetable tissue; in fact it seems highly probable that it is only animal tissue."

It will thus be seen that every effort was made to assure ourselves if the specimen is brain and nothing else. Some convolutions and fissures are well marked: others are obscure. Some distortion has occurred in the drying, so that an entirely satisfactory study of the fissural pattern cannot be made. This is much to be regretted, because the comparison of an average brain of today with a brain (presumably an average one) of an Indian of several hundred years ago would be instructive.

The study which is now being given to the brain is disclosing very much of interest and value. It may not be generally known that at Cornell University a collection of brains of moral and educated persons is being made by Prof. B. G. Wilder for the purpose of thorough study: and thus far he has published the results of some valuable observations.

DECORATIVE SYMBOLISM OF THE ARAPAHO[1]

By A. L. KROEBER

The Arapaho, a tribe of Plains Indians belonging to the Algonquian stock, practise a form of art very similar in material, technique, and appearance to that of the other Plains tribes, of whom the Sioux are the best known. This art is in appearance almost altogether unrealistic, unpictorial, purely decorative. For the greater part it consists now of beadwork, which has nearly supplanted the older style of embroidery in porcupine quills, plant fibers, and perhaps beads of aboriginal manufacture. The other products of this art are objects of skin or hide which are painted with geometrical designs. On the whole the decorative, geometric character of Arapaho art is very marked. Almost all the lines are straight. The figures in embroidery are lines, bands, rectangles, rhombi, isosceles and rectangular triangles, figures composed of combinations of these, and circles. The designs painted on hide are composed of triangles and rectangles in different forms and combinations.

On questioning the Indians it is found that many of these decorative figures have a meaning. An equilateral triangle with the point downward may represent a heart; with its point upward, a mountain. A figure consisting of five squares or rectangles in quincunx, the four outer ones touching the central one at the corners, is a representation of a turtle. A long stripe crossed by two short ones is a dragon-fly. A row of small squares at intervals represents tracks. Crosses and diamonds often signify stars. All this is in beadwork. In painted designs a flat isosceles triangle

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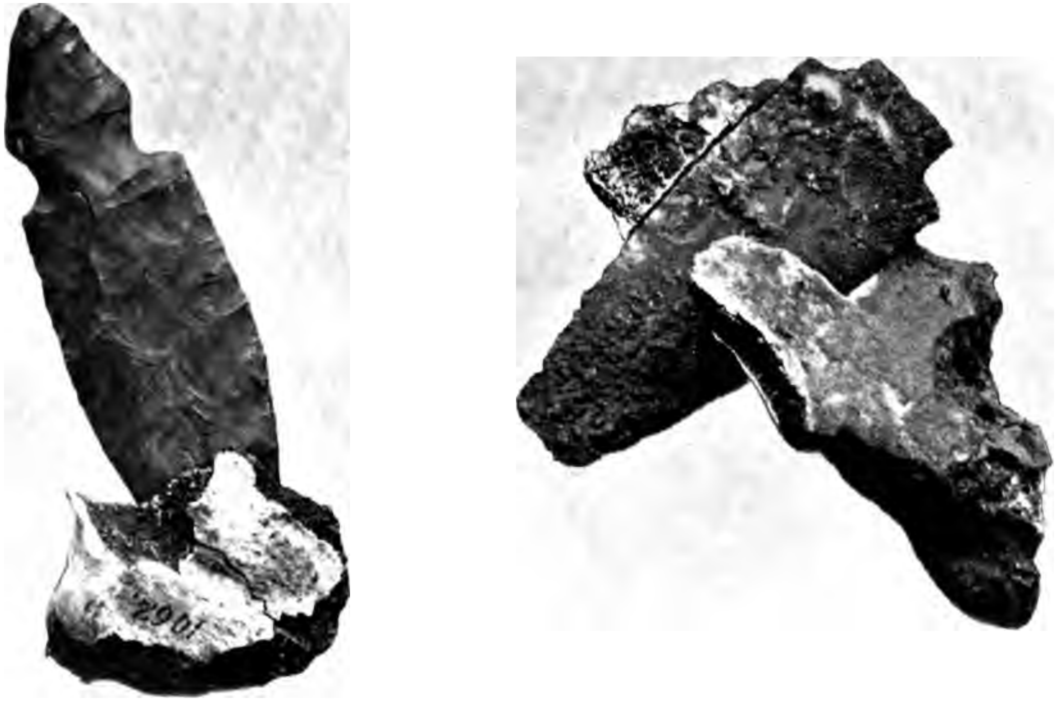
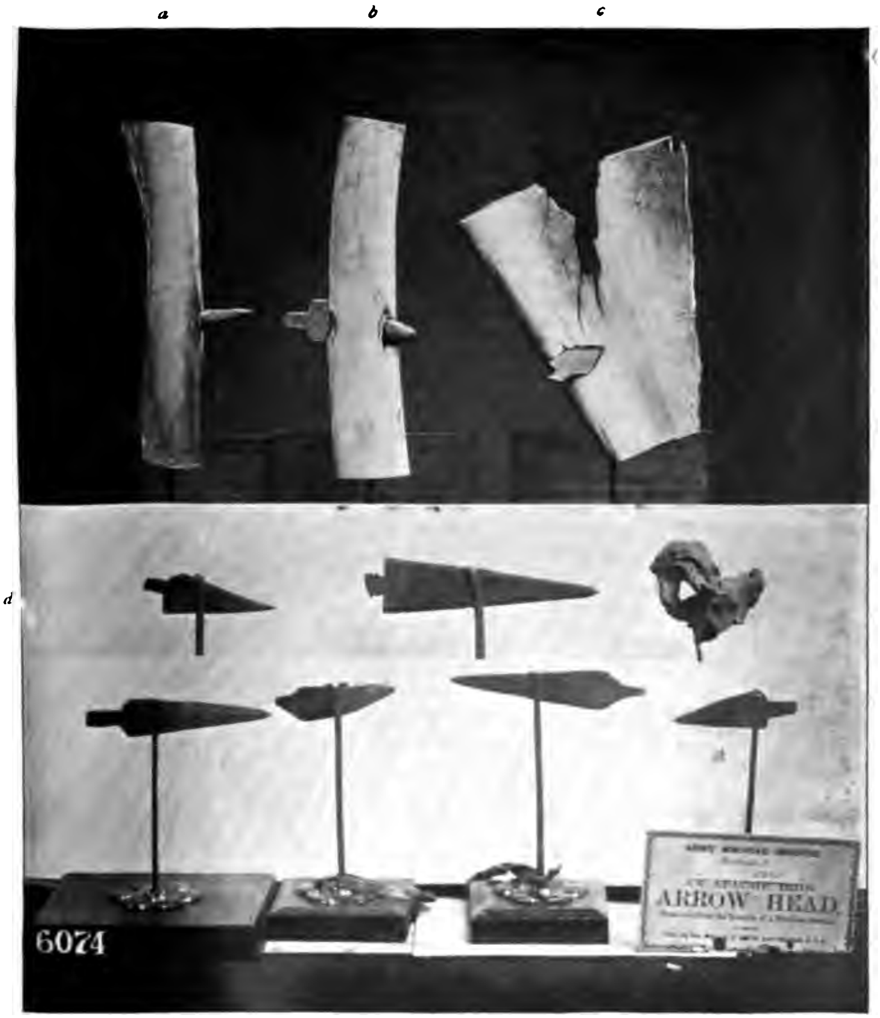
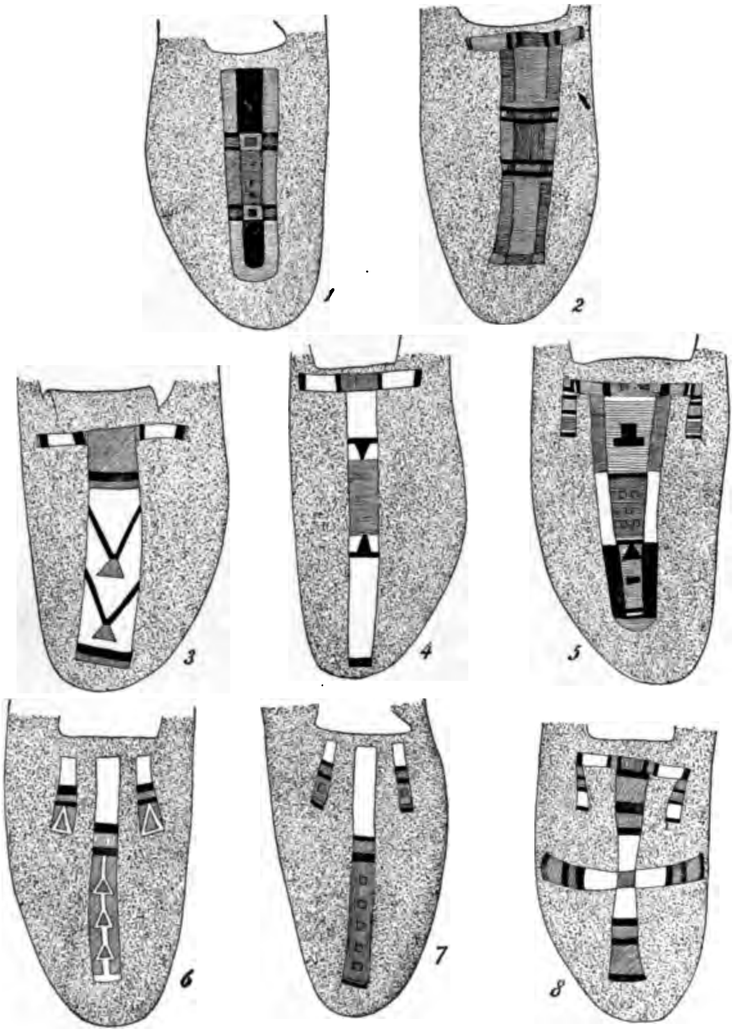
[1] Published by permission of the Trustees of the American Museum of Natural History.



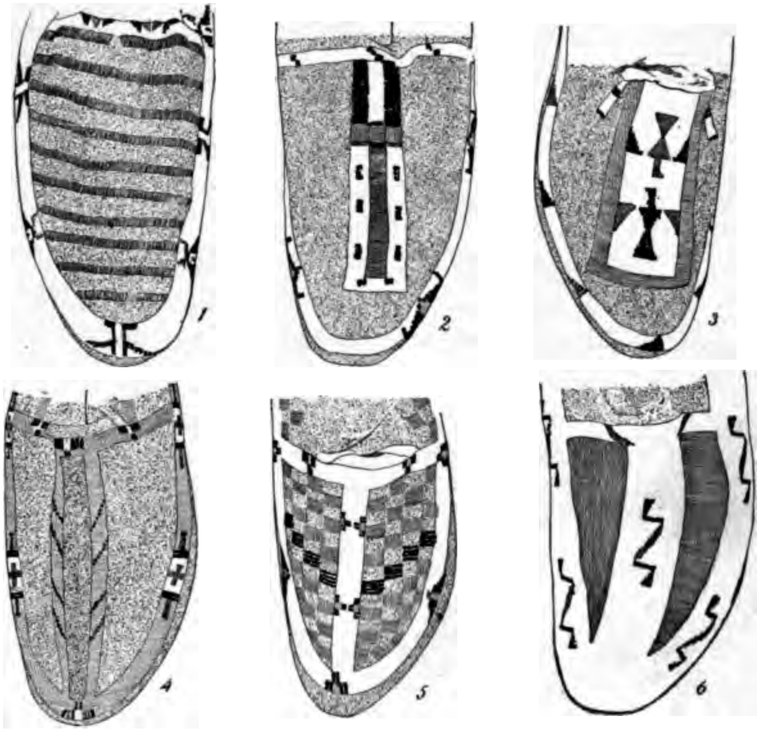
ANCIENT HUMAN BONES PENETRATED BY ARROWPOINTS OR SPEARHEADS. CAVERN, KENTUCKY



a, *b*, *c*, Portions of rib and shoulder-blade of buffalo transfixed by iron arrows fired by Indians in the chase (Army Med. Mus., cat. 4735, 4736, 4737). *d*, Hoop-iron arrowhead withdrawn from brain of United States soldier nine days after being wounded in attack by Apaches.



ORNAMENTATION ON ARAPAHO MOCCASINS



ORNAMENTATION ON ARAPAHO MOCCASINS

often represents a hill; an acute isosceles triangle, a tent. Many other objects are similarly represented.

An ornamental feature is the symmetrical duplication of most designs. Bags, pouches, skins, moccasins, cases, and other objects are ornamented by being treated as a decorative field within which the designs are symmetrically doubled, or even more numerously repeated. Thus a moccasin, if decorated with the symbol of a mountain on the outer side of the heel, has the same symbol also on the opposite inner side of the heel. Another purely ornamental feature of this art is repetition of a single figure to form a pattern. A stripe is often the representation of a path. This symbol is sometimes used singly, standing alone; sometimes it occurs double, owing to the tendency just mentioned, toward symmetry; and sometimes it is found in a pattern that may be described as a many-colored, drawn-out (i.e., rectangular, not square) checker-board, in which each rectangle or short stripe, whatever its color, still represents a path.

This strongly-marked decorative character of Arapaho art, however, is accompanied by a realistic tendency of such development as at first acquaintance would not be suspected by a civilized person. Several figures connected in meaning may be put upon one object and thus produce something approximating a picture containing composition. When as many as ten or a dozen symbols having reference to each other are combined, a story can almost be told by them. In this way the stiff embroideries on a moccasin or the geometric paintings on a bag may represent the hunting of buffalo, the acquisition of supernatural power by a shaman, a landscape or map, a dream, personal experiences, or a myth.

Arapaho art thus is at the same time imitative or significant, and decorative. Can the origin of this art be determined?

Since Arapaho art consists of the intimate fusion of symbolism and decoration, two theories as to its origin are possible. Either of its two elements may be the original. The Indians may have begun with realism, drawing or working lifelike forms in their art; then, however, the obstacles inherent in the material asserted themselves, or the well-established tendency toward symmetry and repetition into a pattern came out, or perhaps other causes were influential, until the early imitative representations became abbreviated into the conventional decorations that have been described. Or it is possible that the Indians began with mere ornaments. Perhaps even these were not originally ornaments but peculiarities of construction of purely useful articles, which technical peculiarities were later considered beautifying and developed into pure ornaments. At any rate, whatever their own origin, decorations may in the past have existed *per se*; later, some conventional ornament may have accidentally suggested a natural object, whereupon it was modified to resemble this object more closely; the same process occurred with other ornaments; until finally a whole system of symbolism was added to the older system of decoration. The first of these theories is that original pictures were conventionalized into decorative symbolism; the other theory is that original ornament was expanded into symbolic decoration. These are the logically possible explanations of the origin of Arapaho art because we recognize in it two factors, the realistic-symbolic and the decorative-technical.

Let us see if either of these theories can be rendered through the evidence of fact actually certain or at least probable.

One of the most frequent embroidered designs on Arapaho moccasins consists, in its simplest form, of a stripe or band which runs from the instep to the toe. This decorative motive takes varied forms, of more or less elaborateness. The following are a number of moccasins with this type of ornament.

One moccasin[1] (Pl. V, fig. 1, catalogue number $\frac{1}{3709}$) is embroidered merely with a stripe from the instep to the toe. This stripe of beadwork consists of a number of bars or lengthened rectangles of different colors. No information was obtained as to the meaning of the design on this specimen.

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[1] The Arapaho objects described in the course of this article are in the American Museum of Natural History. Their catalogue numbers are given in parentheses.

Another specimen (Pl. V, fig. 2, cat. no. $\frac{50}{683}$) has a similar stripe, about an inch in width, running from instep to toe, and composed of bars or small stripes of six different colors. The distribution of these colors is not like that in the last described specimen, but the pattern and the idea of color arrangement are identical. On this moccasin, however, there is one additional piece of embroidery, a narrow stripe across the instep, that is, transverse to the main stripe and touching it at its upper end. The large stripe as a whole, the smaller bars separately, and the transverse stripe all represent buffalo paths.

A third specimen (Pl. V, fig. 3, cat. no. $\frac{50}{686}$) also has a stripe from instep to toe. This is white, except for a rectangular green portion in the middle. At the two ends of this green part of the stripe are two dark-blue (=black) marks, which are approximately triangular. Across the instep we again find a narrow transverse stripe. This represents a bow. The main longitudinal stripe represents a buffalo path. Its green rectangular portion is a buffalo. The black marks are arrowpoints shot into it. Small projections on these marks, which render them not really quite triangular, represent the barbs of the arrowheads.

Another moccasin (Pl. V, fig. 4, cat. no. $\frac{50}{1021}$) again has the longitudinal stripe. This represents a path, probably with implication of the path traveled by the wearer of the moccasin. The major part of this stripe is white, but portions are beaded in dark-blue (=black), red, and grayish-blue. These colors denote respectively night, day, and hazy atmosphere. On the white stripe are also two curious symbols, which are said to signify sunrise or going over a mountain. A narrow transverse stripe is found in this specimen also; but instead of being contiguous to the end of the main stripe, as on the last two moccasins, it is cut in two by it, so that it exists only in two fragments, one on each side of the large stripe. These two small bars represent insects that are desired to be out of the path, beside it, instead of being where the moccasin will travel in the path.

Another specimen (Pl. V, fig. 5, cat. no. $\frac{50}{410}$) has the main stripe down the foot slightly modified in that it tapers a little toward the toe. In arrangement of colors, this moccasin resembles closely the second one described. In all the specimens just discussed, except the last, the bars of which the main stripe consists are arranged in three groups. In this moccasin this triple division of the stripe also exists. Moreover, in the middle section of this stripe there is a green rectangle, and in contact with this a small dark-blue mark approximately triangular in shape. These two symbols are very like the representations of the buffalo and arrowpoints on the moccasin above described as symbolic of the buffalo hunt. Unfortunately it is not known whether the design on the present specimen had any meaning. So far, accordingly, this moccasin agrees closely with those previously examined. It is further like them in possessing a narrow, transverse stripe of beadwork at the instep. But a totally new feature is found in two small bars that start from the ends of the transverse stripe. They are parallel to the main central longitudinal stripe, but very much smaller.

In all the preceding specimens but one (fig. 4), the large stripe consists of three sections. In the exceptional specimen the upper third or fourth of the stripe is of one ground color, the remainder all of another ground color. Such an arrangement is also found in another specimen (Pl. V, fig. 6, cat. no. $\frac{1}{5707}$). The smaller portion of the stripe is white, the longer part is blue with a pattern imposed upon it. Nothing is known of the significance of any part of this design. The two small bars are present, as in the last specimen, and repeat the markings of the large stripe in simplified form. But the transverse stripe at the instep is missing.

Still another moccasin has its stripe divided into a short upper and a long lower portion of different colors (Pl. V, fig. 7, cat. no. $\frac{50}{582}$). As in the last specimen, there are two small bars parallel to the central stripe and repeating its design, and the transverse stripe is again absent. The stripes and bars all represent buffalo paths. In certain parts of the stripes are small squares colored light blue; these represent buffalo tracks.

The last specimen of this series (Pl. V, fig. 8, cat. no. $\frac{50}{584}$) has the main central stripe, the transverse stripe at the instep, and the small bars repeating the markings of the large stripe. In addition to these three decorative devices that are found in previous specimens, it possesses a fourth one that is new. The central longitudinal stripe (slightly constricted toward its middle) is bisected by a duplicate of itself running transversely. These two stripes thus form a cross. This cross represents the morning star, the variety of colors upon it denoting the variety of colors the star appears to assume. The transverse stripe at the instep represents the sky or horizon. The two small bars are said to be the twinkling of the star as it rises, in other words its rays.[1]

The symbolism of some of these designs is elaborate. The representation of the buffalo in his path shot by arrows from the hunter's bow is coherent and neatly compact. We do not know whether it is a commemoration of a particular event or the expression of a wish for plenty of food, but in either case it has pictographic function. In fact, it is a pictograph, except for the fact that its geometric form renders it illegible for any one but its writer. The star-moccasin is also a pictograph in an ornamental dress.[2]

The conventionality of the decoration seems to have reached an equally strong development. It is apparent that the large stripe from instep to toe is the fundamental motive of this style of ornamentation. All the other motives are also stripes, and even of these there are only two (the transverse stripe and the two short bars), except in the one morning-star moccasin where the basal element is introduced in a new position as a fourth decorative motive.

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[1] Some of these moccasins, it will have been noticed, are without known symbolism. This is due merely to their having been collected without inquiry being made as to the significance of their designs. Consequently, to judge from analogy, it is more probable that they do have meaning than that they really lack it.

[2] Even in true pictographs free from decorative limitations and therefore drawn with the greatest realistic fidelity of which the Indian is capable, the symbols for the morning-star, the horizon, and rays of light are the same as those on this moccasin—a cross, a horizontal line, and vertical or sloping lines.

In short, in these moccasins the tendency to realistic symbolism and the tendency to decorative conventionalism are clearly about in equilibrium. Hence we cannot fairly say that either of these tendencies is the older and original. If one concentrates his attention on the symbolism, or happens to be temperamentally more interested in it, he is very likely to see it more abundantly than the decoration, to be more impressed by it, to consider the entire present art as merely corrupted or abbreviated symbolism, and to advance as an explanation of the origin and development of these designs the theory of conventionalized realism. But if one thinks more of the decoration as such, or if one's mind runs naturally toward the ornamental and technical, he will probably notice mostly this side, regard the significations of markings as trivial and irrelevant additions that may be ignored, and finally champion the theory of expanded decoration. With the one bias we are so overwhelmingly aware of the almost pictographic coherence in the buffalo-hunt moccasin, that we believe that pictures of such topics must have given rise to the present form. With the other bias the conventionality of the pattern that possesses this buffalo-hunt significance is so impressive that we come to think that decorative motives of just such persistence as this must have been the origin of the present form. A first investigator is so struck with the enormous difference of meaning between the ordinary path-stripe moccasins and the morning-star-cross moccasin that he cannot believe they had a common source; each must have sprung from a picture, which was as different from the other as the objects represented are different. A second observer is so impressed by the fact that the morning-star moccasin with four decorative elements differs less from some of the buffalo-path moccasins than many of these with from one to three decorative elements differ from each other, that he thinks that all these designs, however variable their superficial meanings, must have originated in one typical ornamental form.

Both these explanations are thus, in the case of these moccasin-designs, not only logically possible, but they are very naturally believed and advanced as the result of certain mental predispositions. But if we try to remain free from any such inclinations of mind, and if we remember how strongly developed and intimately fused are both the tendencies, we must come to the conclusion that, because symbolism and decoration balance each other, the two theories of conventionalized realism and expanded ornament, though logically admissible, are actually untenable. Rather it seems likely, since the two tendencies are vigorous, and combined, that they are both well established, old, and long in close union; so that formerly designs on Arapaho moccasins, though perhaps ruder than now, were of the same general character, both symbolically and decoratively, as those we know.

Let us consider a second style of moccasin. Whereas in those just discussed the fundamental element of the embroidery was the longitudinal stripe, it now is a border running all around the foot just above the sole. In one particular specimen illustrated (Pl. VI, fig. 1, cat. no. $\frac{1}{5708}$) there is besides this border of beadwork a series of lines of quillwork filling the large space on the front of the moccasin, but as this is embroidery of a different material and appearance, we can disregard it in the present consideration and confine our attention to the ornamentation consisting of the border. It should be added that in addition to the border there is the narrow stripe across the instep.

In a second specimen (Pl. VI, fig. 2, cat. no. $\frac{50}{953}$) there is besides the border and the transverse stripe, the large longitudinal stripe with which we have become familiar. As previously, this signifies paths.

A third specimen (Pl. VI, fig. 3, cat. no. $\frac{1}{5720}$) has the border, the large longitudinal stripe, and the two small bars at its upper end, but lacks the transverse instep-stripe. On the central stripe are two representations of birds, but there is no information as to the meaning of the design.

It is evident that in these last two moccasins there is a combination of the stripe motive with the border motive.

In another specimen (Pl. VI, fig. 4, cat. no. $\frac{50}{658}$), of whose symbolism we are ignorant, the longitudinal stripe is continued farther than previously, so that it meets the border. The stripe is not solidly embroidered: its edges are beadwork, but its interior is left open and merely painted red.

In any moccasin of this design there is left a blank space on each side of the foot. This is the area enclosed by the stripe, the border, and the transverse instep-stripe. It has the shape of a pointed right-angle triangle whose hypothenuse instead of being straight is convex. These two triangular or horn-shaped areas occur in another moccasin (Pl. VI, fig. 5, cat. no. $\frac{50}{327}$). The border, stripe, and transverse stripe are all white. The two enclosed areas are half covered with a checker-board design in several colors, which is said to represent buffalo-gut. This checker-board embroidery also extends around the heel.

If, now, this half-open checker-board work were replaced by solid beading, we should have a moccasin completely covered with beadwork. Such specimens occur in abundance. In one (Pl. VI, fig. 6, cat. no. $\frac{50}{1028}$), whose groundwork is white, the two triangular areas taken together represent buffalo horns. The buffalo trample the ground ; this is represented by the coloring of the two areas. One is red, which denotes the soil, or bare earth ; the other is green, which denotes vegetation or grass-covered earth.

A child's moccasin, also solidly beaded (cat. no. $\frac{50}{1032}$), has as usual a groundwork of white. The two triangular areas are green, and represent horse ears—a symbol of good fortune and future wealth. Between them, the central stripe, slightly modified, represents a lizard.

A last moccasin (cat. no. $\frac{50}{1075}$) is solidly beaded in white. The two triangular marks are banded dark-blue and white, and represent fish.

In these last cases, in fact in most fully beaded moccasins, the decorative elements of border, stripe, transverse stripe, and triangular area are still visible in the embroidery; even though they often become identical in color and are not distinguished in the design, they are used technically.

If we follow the transition from the merely bordered moccasin to the solidly beaded one, and see the same technical or decorative features persisting in all parts of the series from the simplest to the most highly developed form, the ornamental nature of these productions is striking and their decorative origin seems probable. If we consider the realistic representation of, for instance, the buffalo horn, and the pretty symbolism of its coloring, the realistic origin of these decorations seems very hard to disbelieve. Of course there is no reason for leaping at either of these conclusions. Neither phase of this art must be ignored, but both recognized. It is necessary to be aware both of the strong ornamental tendency influenced by symbolism and the symbolic tendency modified by ornamental system.

So far as these moccasins are concerned, it accordingly seems impossible to determine with certainty how the symbolic decoration originated.

Parfleches and bags of rawhide made by the Arapaho are painted on the front with designs that cover most of the surface. The back or bottom is sometimes left blank, or may have from six to ten straight lines (or narrow stripes) painted transversely across (fig. 49). These lines on the bottom usually represent roads or rivers. All parfleches are perforated in front to allow of being fastened with thongs. Occasionally, however, a cautious person winds a rope a number of times around his bag, in order to tie it up more securely. On one parfleche seen by the writer such transverse lines were painted across the bottom. The owner and maker declared that they represented a rope passing over the surface of the back several times for fastening the bag. She showed another parfleche in her possession which was actually thus tied.

In this case the markings may appear to be an instance of the survival, as a decoration, of an atrophied useful feature: first ropes were regularly wound around the parfleche to fasten it, then these were left off but were represented by painting. This technical-ornamental theory seems at first glance to offer the true explanation of the origin of these lines on the back of all rawhide bags. But a moment's consideration shows that it is also within reason to believe the opposite: we can declare that the lines originated from attempts at representing rivers or roads, but that in this case the maker of the bag was struck by the resemblance of the lines to a rope as it was occasionally used, and then gave the new signification of rope to what really were conventionalized representations of rivers or roads.

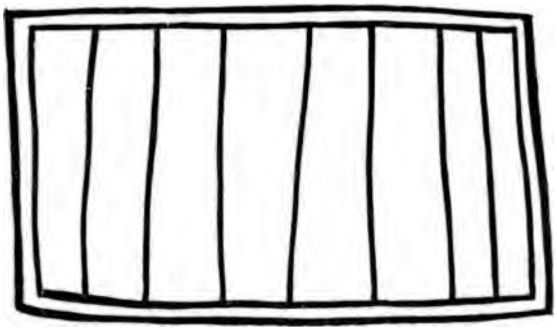

FIG. 49—Marking on Arapaho bag.

So here again we have two explanations (there may be still more) that are plausible, while neither can be proved conclusively. As soon as we go beyond the description of existing circumstances into the inquiry of origin, we enter the realm of uncertainty, of irrefutable doubts.

A peculiar Arapaho medicine-case shows unusual symbolism. The design painted on this is shown, spread out flat, in fig. 50 (cat. no. $\frac{50}{639}$). The ornamentation, which is less geometric than in most specimens of painting, represents the acquisition of supernatural power. Below, on the right side, is the sweat-house into which the owner and maker of the case went before beginning his fast to acquire supernatural power. This ornament also represents a small mound in front of the sweat-house, on which a buffalo skull is lying. The fish-tail ornament just above this is the mountain on which the man fasted, and hence also represents himself. To the right of this, the crescent-topped design is "the over-seer" (the sun), also called "the one that lights." The pedestal or stalk of this figure represents "information" (supernatural power) flowing down from this being to the earth (the horizontal line). At the extreme left, the same design is a representation of himself after he had acquired information and power; and to the right of this, the fish-tail ornament now represents this very medicine-case. But the case is made of buffalo-hide, and his supernatural power consisted largely in control of the buffalo; therefore this same symbol also denotes buffalo. Below, on the left, is the sweat-house into which he went after his fast.

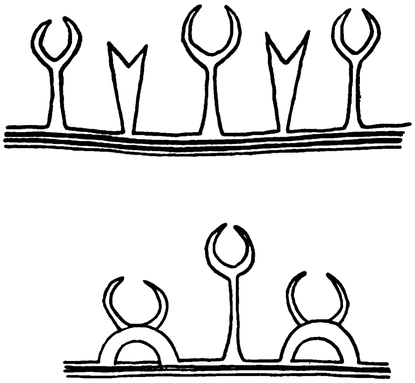

FIG. 50—Design on Arapaho medicine-case.

We have here an example of highly-developed symbolism. It might seem that when so long a story is told and so much abstract information is conveyed, the ideographic design must have arisen directly from the attempt of the artist to express his meaning, i. e., that the design is quasi-realistic in origin. But there is another medicine-case (fig. 51*a*, cat. no. $\frac{50}{401}$) with similar ornamentation (about whose signification we unfortunately have no information). The resemblance of the two designs is great. One consists of an alternating arrangement of two symbols, both forked, the other of an alternating arrangement of these two symbols with a third, the semicircle, added. Some Arapaho say that this style of case was used by a powerful medicine-man and his followers or scholars; but it is uncertain whether this man invented the design or used an already existing one. It is doubtful whether even the symbolism was originated by this man or was similar to an earlier current of symbolism. The most usual ornamentation on Arapaho medicine-cases is a pattern of tents (fig. 51*b*, cat. no. $\frac{50}{688}$) or a combination of triangles and diamonds similar to that painted on parfleches.

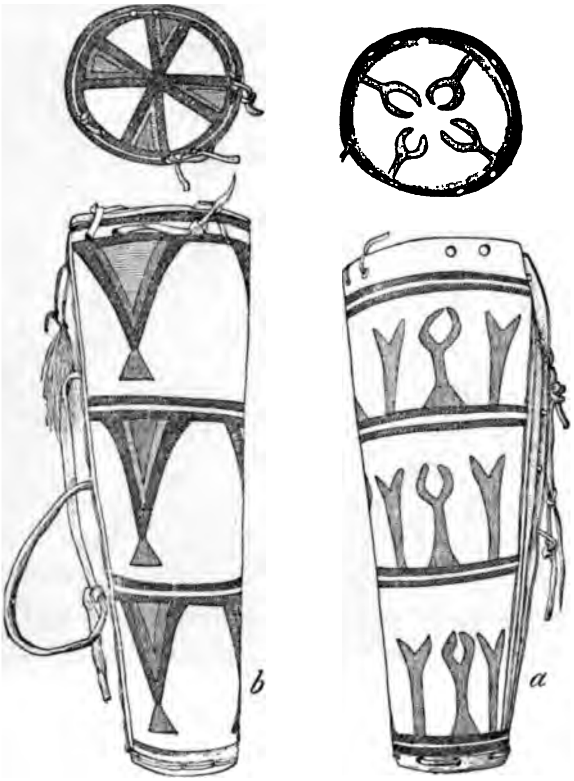

FIG. 51—Arapaho medicine-cases.

So here again there is pictographic symbolism fused with a more or less conventional decoration, and it is impossible to say whether the symbolism or the decoration is the older and original.

Small paint-bags—buckskin pouches to hold body-paint—are in general use among the Arapaho. Some of these represent half of a double-ended fringed saddle-bag. The rest all represent small animals, such as the beaver, lizard, rat, fish, mussel, horned toad, and frog. The opening represents the animal's mouth, two strings that serve to tie up the opening are its forelegs, a loose flap at the end may be the tail, the pouch itself is the body, and other parts are indicated, as there is need, by beadwork, strings, or attached ornaments. The resemblance to the animal represented is often detailed, but never accurate, being ideographic rather than visual, in keeping with all the symbolism of this art. It is generally impossible to recognize what species of animal is meant, and only the maker knows this.

One pouch represents both a beaver and a fish (fig. 52*a*, cat. no. $\frac{50}{301}$), according to information given by its owner. When it is regarded as a beaver, both pairs of strings are legs, and the scallops or notches at the opening are the prominent teeth. A design in beadwork on the pouch, which represents a stream with a dam and beaver-huts, also refers to this signification. When a fish is meant to be represented, the upper pair of strings are the barbels, the lower pair the pectoral fins. The fish-signification is strengthened by a rough line of beads at the edge of the pouch, which are interpreted as fish-scales.

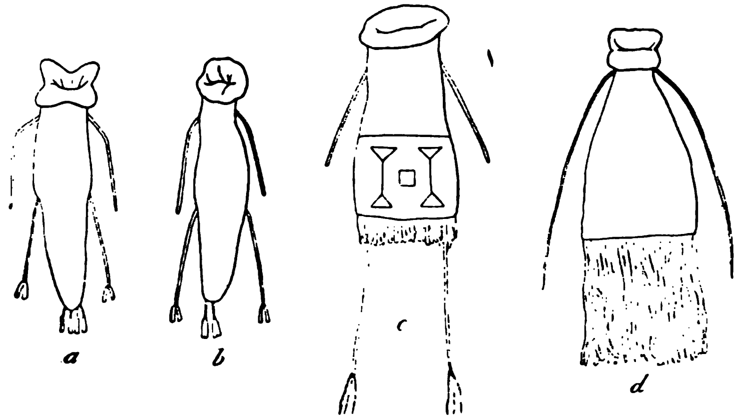

FIG. 52—Arapaho paint pouches.

A very similar pouch represents a lizard (fig. 52*b*, cat. no. $\frac{50}{302}$). Mouth, body, legs, and tail are represented in the conventional manner by opening, pouch, strings, and attached flap.

A pouch that lacks the long flap represents a frog (fig. 52*c*, cat. no. $\frac{50}{344}$). Two long strings indicate the frog's hind legs. A fringe at the bottom represents the grass in which it is sitting. A design in beadwork on this pouch denotes the shoulder and hip joints of the frog, and the food in its stomach.

Another pouch (fig. 52*d*, cat. no. $\frac{50}{601}$) differs in shape from this one only in lacking the two longer strings. It represents half a saddle-bag.

The realistic tendency manifested in the animal symbolism of these pouches is undeniable. A conventional, formal, decorative tendency is evident in the close similarity between the frog-pouch and the saddle-bag pouch, and between the beaver-pouch and the lizard-pouch. Both the tendencies come to light in the pouch with the curious double signification.

Some of the Arapaho say that at the beginning of the world, when the first men, their ancestors, obtained paint, they had only the skins of small animals to use for paint-bags, and that this is the origin of the animal symbolism of the present-day paint-pouches.

It is necessary not to be misled into a belief of this origin and development on the authority of the Indians. Their authority on such a point is absolutely valueless. They believe that the time when the first men obtained paint-bags was four hundred years ago, just after the formation of the world by a solitary mythic being floating on the water, and after a female whirlwind enlarged the minute earth by circling about it. Like all American savages they are almost completely without historical sense or knowledge. Occasionally a striking event may be remembered in a distorted form for a century or two, but on the whole, whatever of actual occurrence is retained in their tales is inextricably blended with mythic and supernatural elements. We have no right to reject the greatest part of their creation myth as so absurdly impossible that it would enter no one's mind to accept it as true, and at the same time to select here and there a point that is within the limits of possibility and proclaim it as historical and reliable.

The mythic and historical elements in primitive legends are not simply mixed together so that they can be distinguished and separated, but they are both equally wonderful and equally true for the savage. No myth can be intrepreted into history by mere elimination of its supernatural portions: it must be rejected in toto. Even though it may be founded on a basis of actuality—and this must often be the case—it is altogether myth. In law, and exact science, and wherever evidence is judged, an account that is in great part manifestly absurd or palpably impossible is not accepted as true after the impossibilities have been subtracted, but is disregarded as a whole. So, too, it is necessary to attach no importance to the statement of the Arapaho as to the origin of these paint-bags.

We have considered several forms of Arapaho art—various objects, various styles, and various materials and techniques. In all cases we have found a well-developed symbolism and a conventional decoration. The symbolism and the decoration exist not side by side but in each other. It has been easy to manufacture explanations of the origin of this art that are plausible theories. But as soon as we are open to recognize all possibilities, such theories are seen to arise from our opinions and methods of interpretation, and to be unsubstantiable by fact. Therefore we can describe Arapaho art, we can characterize it, and distinguish its various coexisting tendencies. We can even, to a certain extent, enter into the spirit of the people who practise it, and understand (i. e., feel) their mental workings. We cannot in fairness lay claim to knowing the cause or origin of this art, nor can we hope to ascertain its cause and origin by studying its products.

In the art of other primitive races conditions very much resemble those just discussed. Everywhere art is conventionalized, under the influence of a definite style. Practically everywhere also it is decorative. This is obviously true of such high arts as those of the Japanese and Chinese. It is true also of Greek sculpture and of Renaissance paintings: though in our modern civilization we are in the habit of regarding the products of these arts detachedly, and enjoy them as if they were complete in themselves, yet every one is aware that the intent to decorate always accompanied the conception and execution of the classic and Italian masterpieces. Even so strenuously realistic an art as modern impressionism is unable to free itself totally from the reproach of being ornamental; for whatever the purpose of the artist, the owner of such a picture has almost certainly secured it for the purpose, ostensible at least, of decorating a vacant wall. In primitive civilizations, the combination of the imitative and decorative tendencies is of course much greater. With very few exceptions, such as in some Eskimo tribes, the realistic, representative impulse is thoroughly impressed and influenced by the highly conventional style; and in all cases this conventional style is decorative. Correspondingly, most primitive decoration, no matter how geometric or simple, has significance and thus is, visually or ideographically, realistic. This is a fact that has not become known until recently, because until lately savages were rarely questioned thoroughly.[1] Accordingly the main characteristic of Arapaho art, its fusion (which is more truly an undifferentiation) of the realistic and decorative tendencies, is also the characteristic of all primitive art.

In Brazil we know of tribes whose painted and incised designs, which are exceedingly simple and geometrical and usually in patterns, are all significant. Diamonds whose corners are slightly filled in are rhomboidally shaped fishes; a pattern of flat isosceles triangles stood up on end is hanging bats, and so on. There are also other representations of the same animals that are slightly more realistic. The same tribes use pots of oval shape with half a dozen variously shaped projections at the rim. The whole vessel represents an animal, the projections being roughly modeled into head, tail, and limbs. Birds, bats, mammals, reptiles, and invertebrates are indicated by very slight modifications. A civilized person unacquainted with the mode of sight and thought of the Brazilian aborigines might very readily mistake a bird-pot for a mammal-pot, and so on.

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[1] The scarcely suspected inherence of realistic significance in primitive ornament has been independently demonstrated from California, British Columbia, Central America, Brazil, Mississippi valley, Siberia, Indo China, Borneo, New Guinea, Australia, and Polynesia, in arts as diverse as pottery, weaving, carving, basketry, drawing, and painting.

In Central Australia bullroarers and other objects are decorated with incised lines. These consist of concentric circles, bands of parallel lines, concentric arcs or curves, and rows of dots or small marks. The ornamentation is not symmetrical, nor even regular; it appears random and rude. Yet in general character these decorated bullroarers resemble each other closely. It has been found that the designs are all ideographic, though the total range of significance is apparently not very wide. Similar marks may on different objects mean things as different as trees, frogs, eggs, or intestines. It is interesting to note that while this art is remarkably crude and unformed both as regular ornamentation and as an attempt to represent objects accurately, it contains a system of realistic expression as well as a system of decoration, both of which are conventionalized—or rather, the union of which is a convention.

The remarkable art of the North Pacific coast of America is certainly one of the most stylistic and conventionalized in the world, while its realistic character is sufficiently marked to give no one room to doubt its presence. Its decorative tendency is so strong that, in obedience to its demands, an animal that is being represented may be cut into parts which are then arranged as suits the requirements of the decoration and not as they are in nature. The chest of an animal may be put over its head, and the tail below; two opposite sides of an animal, which are of course invisible at the same time, will be represented, in order to meet the strong demand for symmetry. The chief decorative motive of all this art is an oblong figure whose corners are rounded and whose sides are very slightly convex, the upper long edge generally curving the most. Almost everything that is represented is brought into this shape or some modification of it. Heads, eyes, mouths, ears, joints, tails, fins, are usually of this shape; the whole decorative field itself often is the same; and in such cases the remaining portions occupied by unenumerated parts, such as back, belly, and wings, are almost necessarily of the same shape. Eyes and faces appear everywhere—on representations of joints, of the chest, of dorsal fins, of hands, in vacant spaces—and their shape is regularly the ornamental one described. Yet with this remarkably strong decorative tendency pervading and deeply influencing every representation, all examples of decorative art from this region are recognizably realistic in intent and often in execution. There is no geometrical ornament that one might take to be meaningless. In short, on the North Pacific coast of America all decoration is realistic and all realism is decorative.

It is of course impossible to prove by selected examples such as these that all primitive art consists of the combination of representative realism and ornamental conventionalism. But that such is the fact, that this undifferentiation continues often into a higher civilization, must be obvious to any one familiar with primitive art. This fusion of two differing tendencies is not merely a frequent or widely distributed occurrence, as are a great many special ethnic phenomena, such as circumcision or doctoring by sucking or angularity of ornament, but this fusion is a rule practically without exceptions. It is universal because it is necessary. Both the representative tendency and the decorative tendency are deep rooted in the human mind, so that it must be virtually impossible to suppress them for any length of time or among any considerable number of men. At times, indeed, as in European civilization, the two tendencies become more separated: our wall-papers are chiefly ornamental, our oil paintings chiefly realistic. But a glance at the past and present races of the world shows that this condition is exceptional, just as a civilization of the extremity of ours is exceptional. The more primitive a people is, we may say, the more intimately fused in its art will these two tendencies be, though, as there is no absolute or fixable scale of primitiveness and civilization, this rule cannot be applied to special cases but merely tends to be true. Other tendencies also are still combined with these two in a sufficiently early and rude condition of society. The symbolism of the Arapaho is as ideographic as it is realistic, and is as much a primitive method of writing as it is of artistic representation. The Australian bull-roarers referred to are, in addition to other things, very primitive maps or charts; so that they are the products of diagrammatic, graphic, visually artistic, and decorative tendencies or activities still undifferentiated—all this in addition to their still more marked religious functions. Of course it is possible for a race to over-develop one of several related tendencies at the expense of others. To a certain degree this does happen in all races, and is what makes the difference between them. But every culture must contain among its motive forces more or less of every tendency, because the tendencies are in the human mind and hence ineradicable. These many tendencies are on the whole less differentiated in more primitive conditions of society. Hence all art, and especially primitive art, contains the combination at least of representative and decorative tendencies, perhaps of others.[1]

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[1] The differentiation here and previously spoken of as accompanying or constituting evolution in civilization is at once too important and universal a matter to be proved here in a few incidental words, and too obvious to require it. A striking example of this differentiation is found in the mythology of our more primitive forefathers, in place of which, and more or less developed from which, we have products as different as romantic novels, fundamental scientific theories, and the doctrinary beliefs of our religions. There is no intention, however, of implying here by differentiation a continuing separation. Where in a savage tribe every man, though in somewhat varying degree, is hunter, warrior, participant in government, shaman, artist, and myth-maker, a higher nation has its separate politicians, soldiers, food-producers, physicians, poets, and so on; but though the tendencies have in this transition differentiated, and have far more than formerly become specialized in individuals, yet they exist only in the culture as a whole: in this, the only true unit, i. e., the only organic entity, they are all combined. For instance, our

The invariable method of explaining the origin of an art has been to select that one of its tendencies which was the most marked or appeared so to the investigator, to imagine the products of this tendency in its most isolated and pure form, and to pronounce these the original state of the art. An observer is struck by the fact that in a certain primitive art many ornamental features coincide with technical ones that are present for practical reasons. He concludes that the technical-practical tendency which he has discovered among the decoration, is the original unmixed impulse that caused the art. Or he may become aware through inquiry or study of the fact that geometric ornament in an art has realistic significance. The realism impresses him; true, it is now modified and corrupt, but that only proves to him that originally it was pure. Ergo, this art began with representative pictures. Such has been the only method of explanation, however much the actual results in different cases differed. No other method of ascertaining or explaining the origin of a primitive art whose history we lack, is even possible.

This method has the fundamental fault that it presupposes tendencies to have existed more unmixedly and separately at some former time than at present. In reality they must in all cases have been in the near past very much as now and in the very remote past more mixed or mutually undifferentiated. Thus we have seen that Arapaho art must some time ago have been very much as now. What it was still earlier we know even less definitely, but we cannot doubt that its spirit must have been similar. Different objects may then have been represented, other

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present-day science could not have arisen nor could it exist without modern industrialism, and this is equally dependent on science. Our literature is absolutely and intimately interwoven with our social conditions, not so much in that poets and novelists actually describe these, but in that the emotions and ideas which form the content of their writing are the typical emotions and ideas accompanying our social circumstances. In proportion with the differentiation of tendencies in evolution proceed their combination and recombination. Very analogously, a mammal is far more highly differentiated than a jellyfish, but none the less are its various organs interdependent and itself a distinct organic unity.

ornamental motives employed in other materials, but even then there certainly was the combination of ideographic symbolism with crude, heavy decoration. As we go farther backward in time, we can be sure that the details of the art were more and more different from those of its present condition. Now perhaps one of its component tendencies was relatively stronger, then another. But whatever these temporary slight fluctuations, it is certain that if we only go back far enough we must arrive at a stage where the tendencies were even more numerously and more intimately combined than now. But if one should believe that Arapaho art can be explained, for instance, by the coventionalized realism theory, the realism being original and the conventionalization subsequent, he holds the view that at some time past this Arapaho art consisted of pictorial representations. This view is logically possible, but in reality it is absurd. This art could not have had so ideally simple a development that we could still trace its original condition, if it were very old. But if it, therefore, were comparatively recent in origin, there must until a certain time have been no art among the Arapaho, while at that moment it sprang up full-blown, not as a crude undifferentiated thing, but a highly-specialized pictorial art. Such an event would be extremely remarkable, not to say marvelous, and more in need of an explanation than the phenomenon it explained. By isolating any tendency that we find in any art, we are led to imagine a purely ideal condition which not only could not have been the original state of the art, but is probably even more different from its original state than from its present known state.

In short, it is impossible to determine the origin of any art whose history we do not know.

Let us briefly consider the field of mythology. There have been numerous explanations of myths and several theories of the origin of all mythology. The principal of these theories are the following.

What may be called the physical or science theory accounts for myths by making them the outcome of a desire to explain natural phenomena. The shapes or colors of animals, the motion of sun and moon, the existence of the stars, strange geologic formations, such phenomena are supposed to have stimulated the wonder of primitive man so much that he made myths to explain them.

The personification theory supposes that deities and other mythic characters, together with their actions,—in a word, mythology—are personifications of natural phenomena. Phœbus, Indra, Agni, are said to have originated in personifications of the sun, heaven, and fire. The solar myth theories, and others of an analogous kind, belong here.

The animistic theory says that there was originally a belief in soul, out of which arose the various systems of spirits and deities. It believes that myths originated from a state of the human mind to which all objects seemed equally endowed with human personality.

These three theories are at bottom the same.

What has been called the allegorical or ethical theory supposes myths to be allegorical inventions with a moral import. Miraculous stories of gods, men, and animals are thought to have been composed in order to teach, by illustration, ethical precepts. This view is not so much in favor now as formerly.

The historical theory makes myths the distortion of actual events. A powerful king of Crete gave rise to the mythic character of Zeus.

The etymological theory calls mythology a disease of language. Misinterpreted metaphors or false etymologies gave rise to myths. To use a familiar example, Zeus is thought to have been originally called Kronion, with the meaning "existing through all time." Later this epithet was misunderstood to mean son of Kronos, and thus gave rise to the conception of a god Kronos.[1]

As explanations, all these theories are untrue. But the tendencies which they recognize exist.

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[1] This does not necessarily exhaust the number of theories.

There is undoubtedly a tendency to explain natural phenomena in myths. The Indians of British Columbia have this story: The bear and the chipmunk disputed whether there was to be darkness or light. The chipmunk triumphed, and for the first time it became light. The angry bear attacked the chipmunk and pursued it. The chipmunk escaped by tearing itself from under the claws of the bear. From this it is striped down its back. This little story, whatever its origin, clearly reflects the tendency to mythologize about such natural phenomena as day and night and the color-markings of animals. Hundreds of similar myths concerned with the spots on the moon, or the blackness of the crow, or a certain peculiar stone, or a similar fact, are known from all parts of the world.

There is also a tendency to identify mythic personages with parts of nature; Thor with thunder, for instance. And the tendency toward animism is so widespread and so deep-seated that it will be recognized without an example.

It must also be admitted that there is something of an ethical tendency in mythologies. Among primitive races ceremonial and ritual partly take the place of our later morality. And very frequently myths deal with ceremonial. The American Indians, the Jews, the Australians, and the Greeks have such myths.

The existence of a historical tendency in myths is demonstrated by the introduction of Attila into the Sigurd saga.

The etymological tendency, finally, is revealed in the following extract from a Dakota myth[1]: An old couple have adopted a foundling. When he grows up he is so successful in killing buffalo that he makes his parents very rich in dried meat. "Then the old man said: 'Old woman, I am glad we are well off. I will proclaim it abroad.' And so when the morning came he went up to the top of the house and sat, and said, 'I, I have abundance laid up. The fat of the big guts (*tashiyaka*) I chew.' And they say that was the origin of the meadow-lark (*tashiyakapopo*)

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[1] Riggs, *Dakota Grammar, Texts, and Ethnography*, 1893.

It has a yellow breast, and black in the middle, which is the yellow of the morning, and they say the black stripe is made by a smooth buffalo horn worn for a necklace."—From this point the myth deals with the adventures of the boy.

It is thus clear that for every one of these theories there really exists a tendency in primitive man which influences his myths.

This multiplicity of tendencies or causative forces necessarily refutes any explanation that uses and allows only one of them. Such have been all explanations of myths. Such they must be, for when more than one tendency or cause is admitted, we can have several tentative suggestions but no longer one positive explanation. The case is analogous to that in art, and does not require detailed restatement. It may be said, in short, that all explanations of myths consist of the ignoring of all the eternal and indestructible tendencies in man with the exception of one which is isolated and elevated as the sole cause of the myth. That such explanations, however clear and impressive they are, cannot be true, is obvious.

Thus we come to the conclusion that all search for origins in anthropology can lead to nothing but false results. The tendencies of which we have spoken are at the root of all anthropological phenomena. Therefore it is these general tendencies more properly than the supposed causes of detached phenomena that should be the aim of investigation.

These tendencies, being inherent in mind,[1] are everlasting. On the other hand they are constantly changing and developing, and varying in their differentiations and combinations. The phenomena of activity have changed as these tendencies and their relations to one another have become modified. Therefore the products of mind (the phenomena studied by anthropologists) are, like mind itself, beginningless (for us). They have no origin. All arts and all institutions are as old as man. Every word is as old as speech. The history of every myth is at least as long as the history of mankind. Of course no myth was ever alike from one generation to the next; no decorative style has ever remained unaltered. But no myth, no artistic convention, nor any other thing human, ever sprang up from nothing. It always grew from something previous that was similar. These principles are obvious, but they are ignored and implicitly denied in every search for an origin.

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[1] The tendencies spoken of throughout this essay must be understood to be the tendencies of social man. They are those tendencies which exist in individuals being parts of a culture, not in isolated individuals as such. There are psychological causes or mental conditions—generally considered physiological—which might also be called tendencies. Such are the tendency to fatigue, the tendency to form habits, the tendency toward imitation by suggestion, and others. These exist nearly identically in all men, whatever their degree of civilization; they seem even to occur with little modification in animals. It is evident that these physiological tendencies are totally independent of cultures. Our knowledge concerning them is due to a psychological study of individual men. On the other hand those tendencies which alone are referred to above are determinable only from a historical study of social groups. The manifestations of these tendencies are activities such as mythology, writing, ceremonials decorative art, castes, commerce, and language.

Every explanation of an origin in anthropology is based on three processes of thought which are unobjectionable logically but are contrary to evolutionary principles and the countless body of facts that support these principles. First is the assumption, implied in the word *origin*, that before the beginning of the phenomenon explained, itself and its cause were absent; second is the belief that a suddenly arising cause singly produced the phenomenon; and the third is the idea that this cause as suddenly and completely ceased as it had before sprung up, and that its product has remained, unaffected by other causes, unaltered but for wear and tear, to the present day. These three thought-processes are present in every explanation of the cause or origin of a human phenomenon, whether the explainer himself be conscious or unconscious of them. Generally, indeed, the origin is not stated unhesitatingly and clearly enough for these three steps of thought to be visible in all their baldness. Often, perhaps, the investigator advancing a theory of origin would himself deny these processes to exist in his reasoning. Nevertheless, every determination of an origin, whether origin means the beginning of a phenomenon or its cause, must imply the existence of, first, a previous different state, secondly, a change produced by an external (non-inherent) cause, and, thirdly, the state that is being investigated.

This three-step process of reasoning is not in itself wrong. When it is declared either that steam in a particular case was, or in general can be, produced from water by heat, this method of thought is employed. The early state is the water, the altering cause the heat, and the present state the steam. In all the physical sciences thinking in this manner is not only permissible but necessary and is constantly done. It is when these thought-processes are used in anthropology[1] that their results become absurd. When we say that the origin of decoration is technique, or that the origin of marriage is promiscuity, or that the origin of the Polynesian Maui is personification of the sun, or that the origin of an alphabet is pictorial art, or that the beginning or cause of anything in human culture is a certain other thing—we assert or imply a distinct and separate antecedent condition and an isolated, definitely limited efficient cause. That such a condition and such a cause really existed we have shown in the consideration of primitive art to be so highly improbable as to make the belief in their reality absurd; and it must be obvious that in all other cases within the scope of anthropology the three suppositions made in every explanation of origin where direct historical knowledge is lacking, possess the same degree of improbability.[2]

If, then, the specific causes or beginnings of specific phenomena are a delusion in anthropology and may not be sought, what can be the subject of investigation? The tendencies that have been referred to so much? Like words and styles and myths and ideas and industrial processes and institutions, all of which are their products, tendencies are both eternally living and everlastingly changing. They flow into one another; they transform themselves; they are indistinguishably combined where they coëxist. So, if our view is wide enough, we cannot properly determine and separate and name and classify tendencies. They really exist only in the whole unity of living activity as parts in the endless organism. This great unity is the true study for the student of man. In it, as parts of it, cultures and civilization-movements, tendencies and individual phenomena, are comprehensible. In it we know their interrelations. Only by understanding its totality can we really understand its smaller parts, those productions that have always a predecessor but never a beginning.

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[1] By the term anthropology there are meant here not those portions of the science which are clearly anatomical and physiological (i. e., resting upon mechanical science and included in it), but those domains generally covered by the titles ethnology, archeology, and history.

[2] If it is true that origins cannot be determined, the supposed origins of words, namely roots, must be imaginary. Whoever gives adherence to the currently accepted theory that language began with roots, deliberately or unconsciously commits himself to these beliefs: That previous to the making of roots, language in the proper sense, as something articulate and definite, was wanting. That with the roots, language began to be, essentially as it is now. That after the formation of the roots no new ones ever arose, but language remained unchanged except for mod-

The fundamental error of the common anthropological method of investigating origins is that it isolates phenomena and seeks isolated specific causes for them. In reality, ethnic phenomena do not exist separately: they have their being only in a culture. Much less can the causative forces of the human mind, the activities or tendencies, be truly isolated. Every distinction of them is not only arbitrary but untrue. Both phenomena and

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ifications of its roots or their combinations into new words and inflectional forms. The improbability of such a process having ever taken place must be clear to any one who believes that never-dying, ever-changing, interrelated tendencies have unceasingly and unitedly been operative in man. The belief in roots as the sources of languages is totally unevolutionary: it is contrary to the axiom that nothing living ever comes but from what is similar and that all change is gradual development and not a process of finished creation. The weakness of the theory of roots is most palpable in the absurdity of the various explanations that are frequently given of the origin of the primary roots. It is true that there is something that may be called roots. In every language there are groups of words similar in sound and related in meaning. The ideal, non-existent centers of these groups of words can well be named roots, and they must be recognized and used in philology. But roots that once existed as such, and gave rise to languages of words in which they can still be seen,—such there never were causes can be properly apperceived only in the degree that we know their relations to the rest of the great unity that is called life. The more this is known and understood as a whole, the more do we comprehend its parts. This, the whole of life, is the only profitable subject of study for anthropology.

INITIATION CEREMONIES OF THE WIRADJURI TRIBES

By R. H. MATHEWS

In 1896 I contributed two articles on Australian class systems,[1] describing the social organization of the native tribes composing the *Wiradjuri* community in New South Wales. They are divided into four groups, called Ippai, Oombi, Murri, and Kubbi, having the marriage laws and rules of descent as set forth in detail in the articles referred to. In other papers I have dealt with the inaugural ceremonies of certain tribes in the northern[2] and southern[3] parts of the *Wiradjuri* territory, but have never before had the opportunity of describing the ceremony as performed in the western portion.

Early in the year 1898 a *Burbung* took place in the parish of Gunnabonna, county of Mossgiel, New South Wales. The native encampment was about half a mile from Blake's waterhole, on Canoble run, about 8 miles east by north from Canoble head-station, or about 33 miles easterly from the town of Ivanhoe. This ceremony, at which two novices were admitted to the privileges of manhood, was attended by the aborigines from Hillston, Keewong, Cobar, Ivanhoe, and Paddington.

In connection with this gathering the manner of summoning the tribes to attend, the procedure in taking the novices away, the ceremonial performances in the bush, and subsequent ritual were substantially the same as described in my former articles on the *Burbung* of the tribes of Lachlan and Murrumbidgee rivers,

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[1] *American Anthropologist*, IX, 411–416 ; Ibid., X, 345–347.

[2] *Journ. Anthrop. Inst.*, Lond., XXV, 295–318 ; Ibid., XXVI, 272–285.

[3] *Journ. Roy. Soc. N. S. Wales*, XXXI, 111–153 ; *Proc. Roy. Geog. Soc. Aust., Q. Bch.*, XI, 167–169.

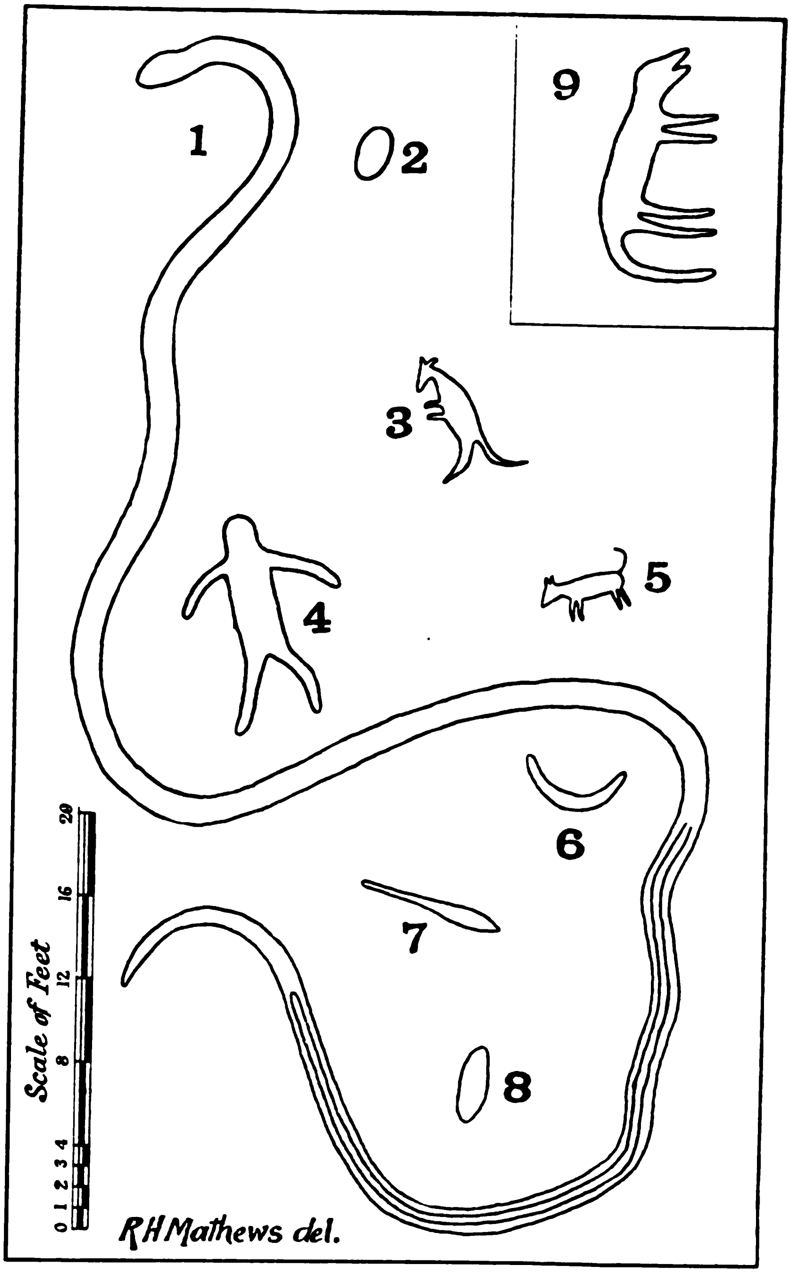

FIG. 53—Ground carvings at a *Burbung* ceremony.

hence they need not now be further dealt with. A description of the *Burbung* ground and its surroundings will, however, be of interest for purposes of comparison.

The circular inclosure called the *boorbung* was about 23 paces in diameter, and was formed by heaping the loose surface soil around its circumference, forming an embankment about a foot wide and six inches high, in which a narrow opening was left to afford access to the interior. From this opening a pathway led away northerly through a forest of myall and other trees 560 paces to the *goombo*, consisting of the usual four elongated heaps of earth,[1] not unlike graves; and a few paces farther on was the *gareel*, or fence of boughs. There were no inverted stumps[2] at the *goombo*, as they are not used by the natives of this district.

The following were some of the carvings in the soil: Starting at the *goombo*, and going 5 paces toward the *boorbung* inclosure, was the representation of a serpent-like monster called the *kurrea* (figure 53, 1), outlined in the soil by a groove cut with a sharp-edged wooden instrument. This was by far the longest native carving in the soil that I had ever seen, the distance from the head to the tail, following the sinuosities of the body, being 130 feet, while the width, which was fairly uniform, was from 15 to 18 inches. Within the outline of the posterior portion of this monster were two other incised lines, one on each side, but whether these were intended to represent the intestines, or for the purpose of ornamentation, or to denote a young animal within the larger one, I could not learn.

Not far from the *kurrea's* head was an oval object representing an emu's egg (figure 53, 2), 2 feet 6 inches in length. Farther on was a kangaroo (3), a little over 6 feet high. In one of the bends of the monster's body, a man upward of 10 feet high was delineated, with an elongated body and short legs (4). There was also the drawing of a dog (5), about 4 feet long, and on the opposite side of the serpent's body was a large boomerang (6), and a little way farther a nulla-nulla (7). Then there was an elongated depression, nearly 3 feet long, 14 inches wide, and 6 inches deep (8), representing the pudenda of a woman. Small leafy twigs and green grass were suggestively stuck in the loose soil around this depression. The drawings shown in the illustration are in their correct relative positions as they appear on the side of the path.

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[1] *Journ. Anthrop. Inst.*, Lond., XXV, 301.

[2] Ibid.

In several places along the pathway there were cut in the soil representations of the footprints of men, emus, and kangaroos; boomerangs, eggs of birds, and patches of the usual *yowan* patterns. At other places some small sticks, leaves, and rubbish were scraped into circular heaps, about 3 feet in diameter and 2 feet 6 inches high, representing the mallee-hen's nest. There was also an imitation of a wombat's burrow.

About a hundred yards from the great serpent was a drawing apparently representing some imaginary animal of the dog or opossum tribe (9). This was a little over 9 feet long, exclusive of the tail. Only a few trees were marked, because most of the timber growing near the pathway was too small for the purpose. The few markings were not noteworthy. In one of the trees was the imitation of an eagle-hawk's nest.

At the ceremonies connected with the arrivals of strange tribes, and during the daily performances while awaiting their arrival, an image of Dharamoolan was set up in the vicinity of the *goombo*. A sapling was found with two branches growing opposite each other, and these branches were cut off at about the length of a man's arms. The bole of the sapling was then cut through on one side of these "arms," sufficiently long for the head, and on the other side of the branches, or arms, it was again cut through at a distance of about five feet. On this framework, mud mixed with grass was plastered and fastened with string, so as to make a rude figure of a man with only one leg, since according to aboriginal mythology the maleficent being known as Dharamoolan has one leg only. This figure was either propped up with forked sticks or laid against a tree to support it in an erect position. Two of these images were used at the *Burbung* referred to, but sometimes three or four are made, if the assemblage is a large one. They are carefully hidden away and covered with bushes when not in use, and at the conclusion of the ceremonies they are destroyed in a fire.

THE DEVELOPMENT OF ILLUMINATION[1]

By WALTER HOUGH

Before the period of artificial illumination there were many manifestations of light in nature coming to the aid of the denizens of the earth during the hours of darkness. Of these were the so-called luciform appearances, including the aurora borealis and australis, which enliven the long nights at the polar zones; the magellan clouds of the southern hemisphere; the zodiacal light whose cause was long a subject of speculation; and the diffused light of the milky way, known to the Chinese as the "River of the Sky."

The light from the stars and planets is not inconsiderable. Under the clear night sky of the Arizona deserts the atmosphere seems charged with star mist; eminences miles away may be outlined, the dial of a watch may be read, and a trail followed with little difficulty. These are the conditions under which night journeys are made to avoid the burning sun. The planet Venus, at inferior conjunction especially, sheds light sufficient for the traveler over open country.

There are at times nights of remarkable luminescence. Clouds become phosphorescent, and often under certain states of electric stress, during high winds, glimmer with a faint light not amounting to a discharge of the electric fluid. Frequently successive flashes of "heat lightning" aid the traveler in finding his way. It is possible, also, that the soil over certain regions may become phosphorescent under the light of the sun and retain the property during the night, as certain gems are phosphorescent after being submitted to sunlight. Snow has this property. Gaseous emanations of a phosphorescent character are occasionally abundant enough to produce temporary illumination.

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[1] Read at the Congrès International d'Anthropologie et d'Archéologie Préhistoriques, XII Session, Paris, August, 1900.

Next to the sun in value to man as a light producer is the moon. Though intermittent in the power and duration of its light, the moon has proven a valuable auxiliary on the night side of man's life, and its period has given a measurement of aggregates of time.

In torrid climates, and at hot seasons of the year, work is often carried on by moonlight in order to escape the heat of the day. While moonlight is 450,000 times less bright than daylight, under certain favorable conditions the light seems intense and ample for many purposes.

The well-known phosphorescence of lichens has been found to give considerable light during warm, moist nights in the summer. Certain flowers are phosphorescent, or emit flashes of light, as the tuberose and moonflower. In the vegetable world there are numerous sources of light whose faintness causes them to escape ordinary observation. As an aid to man, however, the light from the vegetable kingdom is far less useful than that yielded by the animal kingdom.

When the animal kingdom is reached, numerous examples of light phenomena connected with vital processes are found. The familiar firefly of northern latitudes frequently renders summer nights luminous, while the tropical noctilucidæ yield an actual and valuable illumination which has been utilized as light in several interesting ways by the inhabitants of regions in which the insects are found.

The distinguished traveler Kaempfer described the fireflies of Siam as " settling upon the trees like a fiery cloud," and in Brazil Gardner compares them in brilliancy with " stars that have fallen from the firmament and are floating about without a resting place." Kidder says: " In the mountains of Tijuca I have read the finest print of *Harper's Magazine* by the light of one of these natural lamps placed under a common glass tumbler, and with distinctness I could tell the hour of the night, and discern the very small figures which marked the seconds of a little Swiss watch. The Indians formerly used them instead of flambeaux in their hunting and fishing excursions, and when traveling in the night they are accustomed to fasten them to their feet and hands. And they are used by señoritas for adorning their tresses. Prescott narrates the terror they inspired in the Spaniards in 1520. 'The air was filled with "cocuyos," a species of large beetle which emits an intense phosphoric light from its body, strong enough to enable one to read by it. These wandering fires, seen in the darkness of the night, were converted by the besieged into an army of matchlocks.' So says Bernal Diaz." [1]

The bearing of the light of the firefly on the light of the future is very important, and the investigations carried on at the Smithsonian Institution a few years ago may introduce a new epoch in illumination. A brief account in the *Philadelphia American* states that, "some interesting experiments upon the nature and origin of the light emitted by the firefly have lately been made by Professor S. P. Langley. From the spectroscope he finds the light to be of exceedingly narrow range of refrangibility. The heat given out is scarcely appreciable, being less than one-half of one percent of that produced by an equal amount of light from a candle or other common illuminant. That the light is a chemical product would seem to be established by the fact that it decreases by products which check combustion (e. g. nitrogen) and increases by products which aid combustion (oxygen), and that the product of the process is apparently carbon dioxide. The subject of the origin of 'phosphorescent' light is one that may develop very interesting features, for, as graphically stated by Prof. Oliver J. Lodge, if the secret of the firefly were known, a boy turning a crank might be able to furnish the energy necessary to light an entire electric circuit. From this standpoint Professor Lodge regards as enormous the waste of energy in the machinery of electric light making now in use."

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[1] Kidder and Fletcher, *Brazil and the Brazilians*, Phila., 1857, p. 293.

Most of the one hundred and fifty species of animals which are light-producing inhabit the sea where their light is of small importance to man. The wonderful phosphorescence of the tropical seas, which has drawn forth many descriptions of its beauty, is caused by the collective lights of myriads of infusoriæ on the surface of the water.

The day opens up a vast field of activities requiring light for their prosecution. Solar light is normal for the carrying on of these activities, and the night is normal for rest and recuperative processes. The important phenomena of the day are sunrise and sunset; and the day's labor regulates itself to twilight, morning and evening hours, and the hours of broad day divided by the meridian of the sun. Sunrise is attended with certain phenomena, which observant people have noticed.

The Hopi tribe of Arizona, for instance, employ the following terms for sunrise: Sunrise, *talavaiya;* place of sunrise, *tawa yum tyaki;* faintest dawn, *kŭyañiptü;* first light, *talti;* light of sunrise, *taldóve;* yellow light of sunrise, *sikyañüptü;* before emergence of sun, *tawa küyiva*, "sun appears"; sun-up, *tawa yama.*[1] Few tribes indeed have not been impressed with dawn and sunset, and few in the oblique latitudes have failed to mark the seasonal progress of the sun along the horizon.

There is a wide difference in the amount of sunlight enjoyed by the dwellers on the earth's surface, depending on the height and configuration of the land, its absorbtive and reflective qualities, the presence of forests and vegetation, the amount of moisture and dust in the air, cloud formation, and other elements which suggest themselves to the reader, producing local and periodical variation. To these must be added the seasons and the position in latitude determining the length of the day and the duration of twilight.

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[1] Authority of Dr J. Walter Fewkes.

The superabundance of sunlight has brought about many devices for warding off and tempering the rays and ameliorating their heat. For protecting his eyes from the excessive light man has devised eye-shades, hats, and parasols; and for shade and protection from the heat, shelters of brush, skin, or cloth. In some environments the chief function of the house seems to be for shelter against a burning sun, and this points out a probable origin of the house in tropical countries.

Nowhere is this regulation of daylight more thoroughly carried out than in our modern houses of the temperate regions whose development has been along the praiseworthy lines of more light and air. What the ancients directly accomplished by small light-openings requires now hangings, lace curtains, inside shutters, blinds, perhaps sash curtains, outside shutters, and an awning. These may further be reënforced by shade trees. With all these adjuncts one might be led to believe that the dim light of the early houses is still preferred by the moderns.

As a corollary of protection from the sun follows the observation that tribes living in the shade become lighter in color than their fellows living in the open country. It is also true that there is a characteristic facial modification, such as wrinkling and contorting about the eyes produced in those who are exposed to the glaring light of the deserts or the sea.

Without doubt man is a diurnal animal; his eyes have not the condensing power of those of the *Felidæ* and other nocturnal beasts. The man-apes are also day animals, and those tribes of mankind retaining a degree of primitiveness regulate their rest to the setting and rising of the sun.

With the use of fire begins the history of artificial illumination. The nocturnal light of nature became then of little moment in comparison with fire-lights and the burning brand in the hand of man; the conquest of light over darkness was signalized, and the night side of man's life and his progress toward culture became a theme of surpassing interest.

There perhaps cannot be a satisfactory reconstruction of the period before the knowledge of fire, and the difficulty persists in the subsequent stages of the acquisition and use of fire, and the generation of fire at will—stages grasped by the philosophic mind of Paul Broca.

One fact stands out clearly, that man unacquainted with fire is unknown. With the light of the camp-fire comes the torch, and from this starting point, by the help of observations on less civilized peoples, it may be possible to reconstruct the history of artificial illumination and to check it in some degree by the aid of archeology.

The following table, briefly epitomizing the development of the candle, is presented as the result of extended research in this direction:

DEVELOPMENT OF THE CANDLE

PROTO-ILLUMINATION IN LINE OF TORCH:

Fireflies used as torches. Fat bodies of birds and fish burned for light.

Proto-torch (Adventitious and Temporary):

1. Firebrand, branches, resinous wood, bark, leaves, etc.

Torch (For Customary Use):

2. Slivers or other elements tied together in a bundle.
3. Roll of resin wrapped in leaves.

Proto-candle:

4. Rope soaked in resin.
5. Fiber soaked in fat or wax.
6. Rush soaked in grease.
7. Stick or splint with grease for lighting.

Candle:

8. Mass of fat formed upon a stick around which is wound a wick of fiber.
9. Candles of wax or fat.
10. Dipped candles.
11. Molded candles; improved and art candles of 20th century.

While the line of development has proceeded from the rude torch to the candle, the steps marked in the series are suggestive, embracing devices used by different peoples and at divers times. There is not space here to present the results of investigations among different peoples and in special areas. It will be seen that the purpose for which light is to be used, the place in which it is to be used, the period, and the resources of the environment, are among the modifying influences on materials and apparatus. Hence, the complete steps of the development may not be exemplified in a given area, though a number of superposed phases of light utilization may exist side by side. It is true, also, that the growing need for light has brought about a closer association of the means of illumination with the life of man. The smoking torch, for example, is utilized for open-air illumination, while the candle enters the house and companionship of the family.

Following the torch in the line of development comes the lamp, which separated from the stem of the torch at a period when oils and fat came to be used. This may have occurred (1) as a concomitant of migration or after the domestication of animals whose fat was available; (2) at the time of the discovery of mineral oil, (3) or of the utilization of vegetal oils, such as that of the olive and the cocoanut.

The lamp appears to have arisen at a period after migrations into the temperate zones had brought man into new conditions. The principal of these was the longer night, and joined to this was the settlement in comparatively permanent habitations. In this view the firestick and torch were the essential accompaniments of early migration and without doubt determined the spread of man over the earth's surface.

Since the torch, from its perishable character, is rarely found on ancient sites, there is little to be said as to its archeology. The lamp, on the contrary, being a higher idea, involves work in stone, pottery, bronze, or iron, producing objects which survive burial in the soil. Discoveries by French archeologists have shown that the lamp was in use at the close of the lacustrian bronze age, and up to the present time these are the most ancient objects which have been found that are unmistakably lamps.

It would seem that the lamp with a wick had its origin at a culture plane represented by that of the bronze age, though such employment of fire might have been prefigured by usages in the age of polished stone. Again, the latitude and consequent difference in temperature of stations have exerted controlling influence on the character of the early lamps which it might be possible to employ. Thus climatic conditions render the fuel supply of the lamp solid or fluid and broadly determine the form of the reservoir.

It is almost safe to say that the higher types of illuminating apparatus would not have developed except in the temperate zone or the region of long nights. The tallow candle is a device of cold regions; the same may be affirmed of the open fat lamp. The form of the latter seems to depend upon the character of its fuel supply, and this cause no doubt constantly gives rise to forms of extreme primitiveness in the midst of a high civilization, aside from those descending from the primitive type and retained in use through the working of the large body of survivals of custom in every society.

DEVELOPMENT OF THE LAMP

The series might have grouped at the beginning devices for producing a temporary light and those undifferentiated lamps of skulls and bones. The bodies of birds and fish burned by means of a wick also may be classed with the lamps.

Temporary Light

1. Oil bag from which oil is thrown on a fire to produce a temporary light. Kwakiutl Indians, British Columbia. Lighting apparatus of skulls or bones suggestive of primitive lamps.

2. Lamp. Unworked beach stone with a concavity, supplied with oil and having the wick laid along one edge. Aleut shell heaps.

3. Lamp. Hollowed beach stone with moss wick arranged along one edge. Worked stone lamps. Eskimo.

4. Lamp of pecten shell with oil and wick of rush pith. Ainos, Japan, Fusus shell hanging lamp. Orkney islands.

5. Lamp. Terracotta saucer, China. India, etc.

6. Terracotta saucer with edge pinched up into gutter or gutters for wick. Syria and India.

7. Lamp. Terracotta. Reservoir almost closed over; spout for wick. Lamps of pottery with reservoir closed over. Lamps of bronze with one or more wick-spouts. Roman.

8. Lamps of iron of simple shape with plain open or closed reservoir and with spout, and often having drip catchers and a device for tipping to allow the oil to reach the wick. There is considerable variety of such lamps, which were used in Europe before the epoch-making invention of Argand. Being products of the blacksmith's hammer, they present a certain crudity, as of antiquity. However, there is no reason to doubt that they are the survivals of the forms of the iron age.

It may be interesting to briefly pursue the line of the lamp into the inventive age.

Lamps of the Inventive Era

9. Lamp of brass with reservoir mounted on rod and stand; several curving spouts. Italian. Development from the Roman lamp.

10. Lamp of brass designed to furnish heavy oil to the wick under hydrostatic pressure. Flemish.

11. Lamp with chimney; draft to flame and heavy oil under gravity pressure. Argand's invention and French inventors.

12. Lamp with chimney and argand burner; heavy oil under forced pressure of a spring. Devices for heating heavy oil. France.

13. Lamp of glass having one or two tubes; for burning whale oil.

14. Lamp burning "camphene" by means of wick and tubes and without chimney. United States.

15. Lamp with chimney; ventilated burner; woven wick raising refined petroleum by capillarity. United States, 1870. Developed burner to end of century.

At present the destiny of illumination is in the hands of the investigator and inventor. Who knows to what heights their efforts will lead? But before the inventive era, before Argand, if you please, the world satisfied its needs for light with the immemorial simple lamp and smoky torch, increasing the illumination at times by multiplying the number of lights, and casting over scenes of splendor the flare of torches little removed in simplicity from those of prehistoric man.

It may be a wholesome correction of our pride in the advance of a century to reflect that most of the human race is still in the uninventive period, depending for light on torches and simple saucer lamps. The epoch-making invention of the chimney and the discovery of boundless hydro-carbons in the earth have not yet reached the majority of mankind, while the electric light casts its bright rays in a very small area of immense obscurity. Still, there is progress, and gradually tribes, from their beginnings unacquainted with more than the most simple illuminating methods, are seeking more light.

It is interesting to note in this connection the education of the Hopi Indians of Arizona in the use of artificial illumination. The environment of these Indians is semi-arid, and there is such scarcity of fuel in their isolated country that it must be used sparingly for cooking and only as a luxury for illumination. Hence, up to a few years ago all avocations ceased at dark. Four years ago the writer, while encamping at Walpi, noticed only a solitary light at night in the pueblo. There was at that time a demand for candles. Two years later, a number of lights shone from the windows of the village. Lately coal-oil has become known; a great many families possess the luxury of a coal-oil lamp, and this has worked a great change in the habits of the people.

This seems in epitome the history of illumination.

BOOK REVIEWS

Seventeenth Annual Report of the Bureau of American Ethnology to the Secretary of the Smithsonian Institution, 1895–96. By J. W. Powell, Director. *In Two Parts—Part I.* Washington: Government Printing Office, 1898 [1901]. Pp. xciii, [+127*–344*]–468.—*Part II.* Washington: Government Printing Office, 1898 [1901]. Pp. 467–752. With Pls. I–LXXXI (+ III *b*, IV *b*, V *b*, VI *b*, VII *b*, IX *b*), and figs. 1–357.

Besides the Report of the Director, with its admirable introduction summary of work accomplished by the Bureau during the year 1895–96, and brief characterization of the accompanying papers, together with a "List of Publications of the Bureau of American Ethnology," compiled by F. W. Hodge, these two volumes contain: "The Seri Indians" (pp. 1–128, 129*–344*) by W J McGee; "Calendar History of the Kiowa Indians" (pp. 129–445) by James Mooney; "Navaho Houses" (pp. 469–517) by Cosmos Mindeleff; and "Archeological Expedition to Arizona in 1895" (pp. 519–744) by Jesse Walter Fewkes. At pages lix–lxii a graceful tribute to the late J. C. Pilling finds a place.

Dr McGee's memoir on "The Seri Indians" (illustrated with 56 plates and 42 figures) is a remarkably suggestive and informing account of the Seri Indians of Tiburon island in the Gulf of California and the adjacent mainland (a portion of Sonora). Unusual interest attaches to these pages, for the Seri are not only one of the least known of Amerindian peoples, but "must be assigned to the initial place in the scale of development represented by the American aborigines, and hence to the lowest recognized phase of savagery" (p. 295*). After a brief general introduction, the following matters are considered: Habitat, history, tribal features, somatic characters, demotic characters (symbolism and decoration, industries and industrial products, social organization, language), etc.

Reduced to 350 individuals (of these 75 are adult warriors), the Seri are tending to extinction. They survive in an unparalleled state of isolation, their antagonism to the rest of mankind amounting practically to a *race-sense*. In their physical development they display wonderful adaptation to environment, and exemplify in marked fashion processes of selection. By cultivating a reserve in the organism itself, rather than such material aids as more çivilized tribes possess and rely upon, they are able, with a very low general culture, to rise to full advantage in the utilization of their habitat. Their specialization in the direction of organic reserve is so complete as to be, racially and individually, an acquired characteristic. Their water-industry, their navigation, hunting, and fishing all evidence their conquest of both land and sea environment. Alike remarkable are their "pedestrianism" and manual development (with absence of knife or tool sense). In their industries these Amerinds "combine the features of the zoömimic and protolithic stages more completely than any other known folk, and in such wise as to reveal the relations between these stages and that next higher in the series with unparalleled clearness." The prominence of the "elder women" in the management of everyday affairs is marked. The marriage customs are almost *sui generis* and reveal a decided appreciation of sexual morality and restraint. Noteworthy also is the special honor paid to women in funerary rites. According to Dr McGee these Indians exemplify most emphatically the "law of conjugal conation," and the incarnation of primitive ideals. One of the most interesting features of their life is the alternation of long periods of inactivity with short periods of intense activity, with which is associated rapidity of change from one state to the other.

Included in Dr McGee's study are Dr A. Hrdlička's "Report on an examination of a skeleton from Seriland" (pp. 142*–147*), and Mr J. N. B. Hewitt's "Comparative lexicology" (pp. 298*–344*). Dr Hrdlička gives the details of description and measurements of the skull and skeleton (the only undoubtedly authenticated Seri osteological data) of a young female. The symmetrical skull has a capacity of 1545 cc. (Broca) and 1490 cc. (Flower), with a cephalic index of 88.3. In some respects the skull approaches that of the Caucasian. There are also indications of prolonged physical adolescence. On page 141* is a report on a skull supposed to be that of a Seri, but with no certainty. Mr Hewitt's paper consists of a detailed study of the limited linguistic material—pronouns, numerals, and conceptual terms—in comparison with corresponding words in Yuman dialects. The result of this searching analysis (all the evidence is incorporated in these pages, so that other investigators may make use of it) is to demonstrate that the language of the Seri is structurally and lexically unrelated to the Yuman stock, with which earlier authorities allied it. The Seri pronoun for *thou* shows a vague resemblance to the corresponding

Yuman term, the word for *dog* has probably been borrowed from Pima, and there may be a few loan-words from other tongues, but even seeming kinship does not attach to more than a dozen and a half words of the Seri vocabulary so far studied. Mr Hewitt's study is one of the most thorough-going pieces of linguistic analysis we have had for some time.

Altogether, Dr McGee's memoir, based upon his investigations in Seriland in 1894 and 1895, is an exceptionally valuable addition to our stock of knowledge about the lowest races of man now existing.

Mr Mooney's "Calendar History of the Kiowa Indians," which is accompanied by 25 plates and 187 text-figures, is a most valuable and illuminating interpretative study of a series of Amerindian records. After some brief remarks on calendars in general comes a sketch of the Kiowa (pp. 148–242) dealing with ethnography, history, sociology, and religion. This is followed by a brief sketch of the Nadíisha-dena, or Kiowa Apache, a small Athapascan tribe associated with the Kiowa from the earliest traditional period (pp. 245–253). The rest of the paper is devoted to the discussion of the Kiowa annual calendars, followed by a list of military and trading posts, missions, etc.; a Kiowa-English (pp. 391–430) and English-Kiowa Glossary; and a list of authorities cited.

The Kiowa calendar and the Dakota calendar "are the only ones yet discovered among the prairie tribes." From Anko, a Kiowa warrior, was obtained "the only monthly calendar so far discovered among North American tribes." Of the events noted, Mr Mooney observes (p. 146): "The records resemble the personal reminiscences of a garrulous old man rather than the history of a nation." For comparison, "the chronicles of the highland clans of Scotland," or "the annals of a medieval barony" suggest themselves.

The connection of the Kiowa with the far north makes their history very important in the annals of the aborigines of the trans-Mississippi region. The Kiowa are also remarkable from the fact that "the clan system does not exist among them, and there is no evidence that they ever had it,"—in this they resemble the Kootenay and some Salishan peoples of British Columbia.

The traits of the Kiowa seem less admirable than those of many of their neighbors, and they have "a large infusion of captive blood, chiefly Mexican." Of their religion the sun-dance and the mescal myth-ritual (the last only some fifty years old with this tribe) are the chief features. The Kiowa Apache "are practically a part of the Kiowa in everything but language."

More interesting, perhaps, than the calendars themselves, are Mr Mooney's discussion of the terms employed in Kiowa chronology, the names of seasons, "moons," etc., and the data contained in the Kiowa glossary. A significant feature of the calendar is the frequency with which smallpox, cholera, etc., are referred to. The tale of rites and ceremonies performed, too, occupies sometimes the entire record. The hints as to the existence of somewhat similar "calendars" among other tribes should be pursued, for all such material, however meager it may be, has a profound psychological interest.

Mr Cosmos Mindeleff's study of "Navaho Houses," illustrated with 9 plates and 15 figures in the text, treats of hogáns of the Navaho Indians chiefly as they were, much of the material upon which it is based having been obtained "some ten years ago, when the recent changes, which have taken place in Navaho life, had only just begun." After some introductory remarks on the country and the people, the following topics are considered: Legendary and actual winter hogáns, summer shelters, sweat-houses, effect of modern conditions, ceremonies of dedication (with texts of certain songs), the hogán of the *Yébĭtcai* dance. The article concludes with an explanatory vocabulary of hogán nomenclature. Like the Seri, the Navaho do not build their houses at springs, a practice which, the author suggests, is "perhaps a survival of the habit which prevailed when the people were a hunting tribe and kept away from the water-holes in order not to disturb the game which frequented them." The houses are built in such out-of-the-way places also as to give one the impression that the country is practically uninhabited. According to Mr Mindeleff, "it is an exceptional Navaho who knows the country well sixty miles from his birthplace, or the place where he may be living, usually the same thing." The taboo of death-places has had much to do with the temporary character of Navaho dwellings. This difficulty has been somewhat overcome by the practice of carrying the sick out to die in the open air.

In Navaho mythology there are many legends of wonderful houses, and early mention of house-building occurs in the creation myths. Their recent resort to agriculture, destructive of former pastoral life, is inimical to the old house-building ideas, and has resulted in an increased permanency of dwellings,—some attempts even having been made to imitate the houses of the whites.

Of the rites connected with house-building we learn that "in the Navaho system nothing of a ceremonial nature is introduced until the conclusion of the manual labor," a matter in which these Indians differ from their Pueblo neighbors. In case of grave fears of malign influence against the occupants of the new-built house, the dance of the *Yébĭtcai*, a very elaborate ceremony (for which a special hogán is constructed), is performed.

Dr Fewkes' memoir, illustrated with 85 plates and 113 figures, is an exhaustive discussion of results, a preliminary account of which has appeared in the Report of the Smithsonian Institution for 1895. Pages 529–576 are devoted to the ruins in Verde valley, the remainder of the paper dealing with ruins in Tusayan (Middle mesa, East mesa, Jeditoh valley, Awatobi, Sikyatki) and the objects there discovered, especially pottery (pp. 650–778), its decoration, symbolism, etc. Of the pueblos, cliff-houses, and cavate dwellings, Dr Fewkes tells us "all these kinds of dwellings were made by people of the same culture, the character of the habitation depending on geological environment." Hence he holds that "the so-called cliff-dwellers were not a distinct people, but a specially adaptive condition of life of a race whose place of habitation was determined by its environment,"— a people who "sometimes built dwellings in caverns and sometimes in the plains, often in both places at the same epoch."

The Verde village sites, Dr Fewkes (in agreement with Mr Cosmos Mindeleff) thinks, "represent a comparatively late period of pueblo architecture,"— they are probably not more than two centuries old. The pictograph described on page 545 suggests comparison with Peruvian rock-sculptures. At Palatki and Honanki, "the majority of the paleoglyphs are of Apache origin, and of comparatively modern date." According to Dr Fewkes, the rectangular form (and not the round, as Nordenskiöld thinks) of the kiva, or religious room of the people of Tusayan is the original one, the round kiva being of foreign origin. The three pueblos of Sikyatki, Awatobi, and Walpi, "will show the condition of Pueblo culture in three centuries,—in Sikyatki, pure, unmodified Pueblo culture ; in Awatobi, Pueblo life as slightly modified by the Spaniards ; and in Walpi, those changes resulting from the advent of Americans superadded." The inhabitants of the older ruins of Tusayan "must have been as far removed from rude Shoshonean nomads as their descendants are today." Dr Fewkes is also of opinion that, "while, as a whole, we can hardly regard the modern Hopi as a degenerate people, with a more cultured ancestry, certainly the entire Pueblo culture in the Southwest, judged by the character of their pottery manufacture, has greatly deteriorated since the middle of the sixteenth century."

With respect to mythology and ritual he observes, "from Taos to

Tusayan there is no pueblo which does not [today] show modifications due to European contact." The detailed discussion of the figures on Pueblo pottery and their relations to mythology and folklore are valuable and suggestive. The sequence of evolution in designs, according to Dr Fewkes, is geometrical figures, birds, other animals, human beings. The rarity of human figures on the pottery from the oldest ruins "would appear to indicate that decorations of this kind were a late development." ALEXANDER F. CHAMBERLAIN.

Eighteenth Annual Report of the Bureau of American Ethnology to the Secretary of the Smithsonian Institution, 1896–97. By J. W. POWELL, Director. *In Two Parts — Part I.* Washington: Government Printing Office, 1899 [1901]. Pp. lvii, 1–518. With pls. I–CLXXIV, and figs. 1–165.

Outside of the usual report, summary, etc., of the Director, this volume is entirely taken up with Mr E. W. Nelson's exhaustive account of "The Eskimo about Bering Strait" (pp. 1–518). Among the topics treated of are: Habitat and people, clothing, personal adornment, utensils and implements, implements used in arts and manufacture, hunting and fishing, art and manufactures, travel and transportation, trade and trading voyages, units of value and measurement, villages and houses, ruins, food, tobacco and smoking, house-life and social customs, morals, disease, mortuary customs, totems and family marks, wars, games and toys, music and the dance, feasts and festivals, masks and other ceremonial objects, religion and mythology, folktales.

The author's investigations were made during the years 1877–1881, when he collected some 10,000 specimens for the U. S. National Museum. Dating from a period before the Alaskan Eskimo were so greatly affected by contact with American whalers, traders, missionaries, etc., the observations of Mr Nelson may be said to reveal to us a very primitive and representative section of the Eskimo stock.

The first half of the paper consists of descriptions of specimens. The section (pp. 232–241) on measurement and chronometry is very interesting, especially from a psychological point of view. As to interracial influence it is noted that on the Yukon and Kuskokwim rivers the Eskimo have borrowed very little from their Tinné neighbors, while the latter have derived a good deal from the former. On Kowak river the case is reversed. Another interesting point is the stimulus given to Eskimo art by the introduction of tobacco from Siberia (snuff-boxes, tubes, ash-boxes, quid-boxes, pipes, tobacco-bags, etc., abound).

The mortuary customs and images of these Eskimo suggest Tinné influence or the reverse.

More important, perhaps, is the claim of the author to have discovered "the existence among them of gentes and totemic signs," but on this point more evidence is needed, for some of the "totemic signs" may be nothing more than property marks. As a result of white contact, the Eskimo near some of the trading stations "are passionately fond of poker." Another effect of the coming of the whites has been to make less common the old friendly contests in trials of strength, wrestling, etc. Of the toys figured, the mechanical doll and mouse deserve notice. The *nith*-songs of the Alaskan Eskimo seem also to have dwindled as a result of white contact. Of the festivals, the great feast to the dead, which takes five days, is the most remarkable,— next the six days' bladder festival. The masks and other ceremonial objects of these Eskimo suggest in several points foreign influence, or it may be that they retain the simplicity from which some of the Indian tribes of the extreme Northwest have elaborated, after borrowing, their more complex forms. In matters of religion, the influence of the whites upon these Eskimo has been very small,—increased secretiveness being about the only tangible result. The "mythic monsters" of the Eskimo invite further study,—Dakotan analogues are suggested here and there. The folktales, which occupy pages 451–518, are of considerable interest. Among the topics to which they relate are : Creation, raven's taking a wife, raven, whale and mink, red bear, giant, the one who finds nothing (of this tale the Eskimo text, with interlinear translation and free English translation are given), the lone woman, the circling of cranes, the dwarf people, the sun and the moon, origin of land and people, the bringing of the light by the raven, the last of the thunderbirds, the land of the dead, the strange boy, origin of the Yugiyhĭk' festival, origin of winds, the strong man, the owl girl, the story of Ak'chĭkchû'gûk, the discontented grass plant, the fire-ball, the land of darkness, the raven and the marmot, the shaman in the moon, the manworm, migration legend, origin of the people at Diomede island and East cape, Siberia. Several of these folktales offer rather close *rapprochements* with the Tlinkit of southeastern Alaska. From St Michael a flood legend is recorded. With Rink's Greenland investigations, Boas' studies of the Central Eskimo, Turner's account of the Eskimo of the Ungava district, Murdoch's report on the Point Barrow Eskimo, and Nelson's present paper, the amount of useful and reliable data concerning this northernmost of human races may be said to be assuming welcome proportions. ALEXANDER F. CHAMBERLAIN.

Apuntes para una Bibliografía Antropológica de México (*Somatología*). Por el Dr NICOLÁS LEÓN. Museo Nacional de México. Seccion Antropología y Etnografía. México: Imprenta del Museo Nacional, 1901. 18 pp.

In the brief introduction to this useful bibliography of the physical anthropology of Mexico, Dr León, who is in charge of the Anthropological and Ethnographical Section of the National Museum, laments the fewness of those Mexicans devoting themselves to somatological investigations. The library of the Museum has few books on the subject, and of the public libraries the same may be said. Nor does there appear to exist either in private establishments or educational institutions a complete collection of anthropometric instruments. This first attempt at a somatological bibliography contains 167 entries, but does not claim to be absolutely complete or exhaustive. The omissions and some misprints in the English and German names will doubtless be attended to in an enlarged and improved edition.

ALEXANDER F. CHAMBERLAIN.

The Fundamental Principles of Old and New World Civilizations, A Comparative Research Based on a Study of the Ancient Mexican Religious, Sociological, and Calendrical Systems. By ZELIA NUTTALL, Honorary Special Assistant of the Peabody Museum, Cambridge, Mass. (Archeological and Ethnological Papers of the Peabody Museum, Harvard University, Vol. II.) 8°, 601 pp., 7 pls., 73 figs.

The author of this volume explains in the preface how she came to be led beyond her special field of research into a comparative study of the early civilizations of the Old World; how she traced the swastika, in Mexico, to an old astronomical source, and, in all countries alike, found its use as a sacred symbol accompanied by evidences of a certain phase of culture, based on pole-star worship and the recognition of the fixed laws of nature which found expression in the ideal of celestial kingdoms or states organized on a set numerical plan and regulated by the apparent revolutions of circumpolar constellations. Her researches seem to justify her conclusions; but she declares that she does not advance any theory. She invites further study and discussion before drawing final conclusions.

This publication reopens the question of pre-Columbian visits from the Old World to the New, and declares that the resemblances or identities between them are too many and too close to be considered mere accidents or the result of independent intellectual development.

The volume treats exhaustively of the prehistoric cultures: American, 284 pages; Asiatic, 82; Egyptian, 77; European, 30, and cultures in general, 75 pages. The author says she entered upon this work without intention to do more than to write a brief monograph on the swastika; this she completed in 41 pages, but by that time she became so interested in the subject and it had so widened and deepened as to demand her continuance of the work, and its enlargement into the present volume of 601 pages. It was a source of regret to the author, not having intended so large or extensive a volume, that the material for the monograph on the swastika (41 pages) was set up and printed; for before this she had changed her purpose and increased the volume to its present size, and was thus left without opportunity to revise the early part.

The author declares her belief that her prolonged study of Mexican archeology has demonstrated that the swastika and the symbols of the cross are accompanied by vestiges of cosmic conceptions and schemes of organization which can be traced to an original pole-star worship. She believes the role of the Phenicians, as intermediaries of ancient civilization, was greater than has been supposed, and that future research will show that America was colonized by Mediterranean seafarers. As the study progressed, she found in her subject an unsuspected wealth, and finally struck the key-note of the law governing the evolution of religion and civilization.

A volume on new, or at least comparatively unknown, subjects, written, as we are informed this one was, a piece at a time—which when completed was sent to the publishers and stereotyped, not to be thereafter changed,—cannot be so smooth and connected as where the author has had the opportunity to rewrite and make corrections; although this volume shows less necessity therefor and, consequently, greater adaptability of the author and knowledge of her subject. This condition of authorship makes itself manifest in another direction which is a drawback to the efficiency of the volume and the understanding of its subject by the reader, for it is without subdivision of book, chapter, or verse. It has no table of contents and contains no notice of any proposition to be presented in the text. This failure of the book to prepare the mind of the reader for the positions sought to be maintained, is a serious blemish and a great inconvenience which could have been avoided by the editor without additional space and with but little labor.

The book has a deeper significance than is apparent at first glance. It deals with the fundamental principles of civilizations and applies itself to all civilizations, old as well as new, throughout the world. The sub-title declares it to be "A comparative research based on a study of the ancient Mexican religious, sociological, and calendrical systems," and the subject-matter is sufficiently comprehensive to justify the title.

The volume opens with the following significant declaration:

> One evening in February, 1898, I left my desk, and stepping to the window, looked out at Polaris and the circumpolar region of the sky, with a newly awakened and eager interest.

This would indicate a new light, or at least a new illumination, of the mind of the author. She had been studying the calendar, religion, and cosmogony of the ancient Mexicans; the Aztec deities had seemed to her numberless, but as she studied them, making each time a more minute analysis, she found their number divided in a remarkable way. The primary conclusion announced is that the Mexicans painted one and the same god under a different aspect, "with different colors" according to the various names they gave him in each instance, and she instances this duplication (p. 8)—an illustration of the profundity of the study and learning of the author as shown throughout the work—by stating that the most mysterious figure of Mexican cosmography, Tezcatlipoca, whose symbolical name means "Shining Mirror," proved to be identical with Mictlantecuhtli, Lord of the Underworld, whose title means also the "Ruler or Regent of the North," since Mictlampa is the name of this cardinal point.

> After having worked, during thirteen years, without any preconceived ideas about the ancient Mexican civilization and without formulating any general conclusion concerning it, I saw all the knowledge I had slowly acquired fall into rank and file and organize itself into a simple and harmonious whole. Realizing this I perceived how, with the origin of the swastika, I had found the origin of the set of primeval ideas which had governed the human race from its infancy and which, in Mexican and Central American civilizations, ultimately developed into their ingenious system of government and social organization. (Page 15.)

As author of the work on *The Swastika*[1] it is gratifying to the reviewer to note the summary formulated by Mrs Nuttall (p. 544):

> In the preceding pages the view is advanced that the ancient cross-

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[1] *The Swastika. The Earliest Known Symbol, and its Migrations; with Observations on the Migration of Certain Industries in Prehistoric Times.* By Thomas Wilson, Washington, 1896.

> symbol or swastika was first used by man, presumably in circumpolar regions, as a record of the opposite positions assumed, by circumpolar constellations, in performing their nocturnal and annual circuit around Polaris. Employed as a year sign in the first case, the cross or swastika later became the symbol of the Four Quarters, of quadruplicate division and of a stable central power whose rule extended in four directions and controlled the entire Heaven.

The author proceeds with her summary and conclusion:

> At some remote period of antiquity man developed the idea of social organization and, in India, ancient Egypt and Babylonia-Assyria, actual proofs exist that the earliest cities and states were divided into four quarters, a division involving the distribution of the population into four tribes under a central chief. Wherever this division was carried out, it represented an attempt to harmonize human society and the establishment of the ideal of a religious democracy, founded on principles of law, order, justice, peace and good will. The pyramid, a primitive form of which consisted of four stories, and cruciform sacred structures, may be regarded as monuments commemorating a cosmical and territorial organization into four parts. The more extended conception of seven directions in space, consisting of the Above and Below, or Heaven and Earth, the Four Quarters and the Sacred Middle, the synopsis of all, was also evolved. In the confederations of India and Iran, and Arabia, in the seven-storied towers of Babylonia, and in the division of the Egyptians into seven classes, we find the earliest traces of a practical application of this numerical division.
>
> The ancient historical records of Egypt and Greece reveal that, in the earliest politics, the population was divided into groups consisting of a fixed number of individuals, officially represented by chieftains, or officers of the state, and that, in consequence, a state formed a unit, constituted according to a mathematical scheme, which was also applied to the regulation of time. Each officer of the state held office for a fixed term, in a prescribed order of rotation. The year was divided into a fixed number of seasons, marked by the positions of a circumpolar constellation, and this therefore appeared to regulate not only the cycle of time but the governmental rotation of office and the entire activity of the community. Starting from a common basis of quadruplicate division in different countries, a great variety of constitutions of state was independently invented by statesmen and philosophers, who devised cycles produced by different combinations of numbers and signs, the object being to regulate time and communal life in imitation of the law, order and harmony existing in the motion of the stars and under the guidance of a supreme ruler, the earthly representation of Polaris.
>
> The origin of these ideas and governmental scheme, in the Old World, is assigned by competent authorities to a northern race which had discovered the art of fire-making and evolved a religious cult and ritual suggested by it, in association with pole-star worship. Their

civilization is supposed to have been developed by contact with a southern race, in Phrygia, and to have been carried at a remote period by their seafaring descendants to India, Asia Minor, Egypt and beyond the pillars of Hercules, to European countries, situated on the Atlantic.

The present investigation brings into prominence the fact that, just as the older Andean art closely resembles that of the early Mediterranean, . . . so the fundamental principles, numerical scheme and plan of the state founded by the foreign Incas in Peru, resembled those formulated by Plato in his description of an ideal state.

The author lays stress on the fact that while there is a marked difference between the Chinese and the Mexican and Peruvian divisions of the elements and numerical cycles, the American systems exactly agree with those propounded by Greek philosophers and said to have reached them from more ancient centers of culture, presumably through the Phenicians. On the other hand, she declares that there undoubtedly exist remarkable analogies between the Chinese and Hindu and Mexican sociological, chronological, cyclical systems, their principles being precisely the same. The close analogies as well as the marked divergences can only be satisfactorily accounted for by the assumption that each of these countries derived its civilization from the same source.

Different writers have pointed out undeniable analogies and resemblances between the highest forms of American civilization and that of China, India, Asia Minor, the Mediterranean, and western European countries. At the same time modern research has shown that the seafarers, the Phenicians, acted as the intermediaries of ancient Old World civilization and formulated a culture which incorporated and formed a curious compound of elements drawn from different countries and people. . . .

As far as she can see, the conditions surviving amongst the aborigines of America would be fully accounted for by the assumption that they received certain elements of culture and civilization from Mediterranean seafarers who, at widely separated critical periods of Old World history, may have transported refugees and would-be colonists or founders of ideal republics and "divine polities" to different parts of the hidden or divine land of "the West," the existence of which was known by tradition to the Egyptian priesthood.

Under such circumstances it is apparent to the author how the American continent could have become an isolated area of preservation where archaic and primitive forms of civilization, religious cult, symbolism, and industries, drawn at different epochs from various and more or less important centers, or from the outposts of Old World culture, would be handed down, transformed through the active and increasing influence of the native elements.

There was one main element, however, underlying both foreign and native civilizations, which formed the basis of both, united and made them as one, namely, the recognition of fixed immutable laws governing the universe, attained, by both races, by long-continued observation of " Polaris " and the " Northern " constellations.

The author concludes thus :

> To me the most precious result of the preceding investigation is the gradual recognition that the entire intellectual, moral and religious evolution of mankind has been the result of the fixed laws which govern the universe. From the time when our world began to revolve in space, at intervals, a luminous point of fixity in space has existed, and an unknown force, irresistible as that which controls the magnetic needle and gyrostat, appears to have raised the mind of man from ignorance and darkness and guided his footsteps towards a higher scale of existence and a more elevated conception of a supreme central power.

Thus the book is filled, sometimes with speculations, elaborate and profound, but many, indeed most times, with theories wonderfully pertinent and attractive ; with statements on every page challenging discussion, if not belief ; and with suggestions that indicate, if they do not demonstrate, not only the intellectuality and power of the writer, as well as her vast reservoir of knowledge concerning the history of mankind, but her profound study of man in prehistoric times and her elucidation of the systems of philosophy by which he has grown from the infant that he was in the beginning of time, to the giant that he became in modern times when in the full enjoyment of his strength.

It is difficult to keep this review within reasonable bounds ; nearly every page of the work contains strange and startling propositions of fact or argument which must either be stated at length or let alone altogether with the recommendation to the reader that he get the book and read it for himself.

THOMAS WILSON.

PERIODICAL LITERATURE

CONDUCTED BY DR ALEXANDER F. CHAMBERLAIN

GENERAL

Azoulay (L.) L'ère nouvelle des sons et des bruits. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1900, 5^e sér., I, 172–178.) The author sketches the *rôle* of the phonograph in years to come, especially as an adjunct to anthropology. Phonographic museums can be established, where linguistic and folklore material can be treasured up for careful study. One of the most interesting uses of the phonograph will be to record the development of language in the child and its regression in the aged. We have had an age of visual enlargement through photography, we are now to have one of auditory extension through the phonograph and kindred devices.

—— Sur la constitution d'un musée phonographique. (Ibid., 222–226.) Outlines a plan for the foundation of a phonographic museum at Paris to contain phonograms of the diverse languages and dialects of the world.

Bardeen (C. R.) *and* **Elting** (A. W.) A statistical study of the variations in the formation and position of the lumbosacral plexus in man. (Anat. Anz., Jena, 1901, XIX, 124–135, 209–238.) A careful and detailed account of investigations carried on in the Anatomical Laboratory of Johns Hopkins University, Baltimore. Race, sex, age, side of body, etc., are considered, but no distinct influence of these upon the number of spinal nerves contributing to the nerves of the leg was detected. Man utilizes more spinal nerves than other mammals. The bodies examined were those of negroes and whites, the plexuses tabulated being 246.

Bawden (H. H.) A bibliography of the literature on the organ and sense of smell. (Journ. Comp. Neurol., Granville, O., 1901, XI, i–xl.) Contains 885 titles of books, articles, etc., many of them anthropological.

Bloch (A.) Pourquoi les anthropoïdes ne sont-ils pas marcheurs bipèdes? (Bull. et Mém. Soc. d'Anthrop. de Paris, 1900, 5^e sér., I, 233–240.) Collates opinions, ancient and modern, as to why the anthropoids do not walk in bipedal fashion. The flexed limbs of these animals are the obstacle. If they walk, they must walk in about the posture of a rope-dancer. This knee-flexion is perhaps a necessary factor of equilibrium, for when a gibbon, or a gorilla, hangs from a trapeze, its legs are much straighter than when standing.

Boas (F.) The mind of primitive man. (Journ. Amer. Folk-Lore, Boston, 1901, XIV, 1–11.) Address of retiring President of American Folk-Lore Society. *See* American Anthropologist, 1901, III, p. 175.

Chamberlain (A. F.) Robert Grant Haliburton, 1831–1901. (Journ. Amer. Folk-Lore, Boston, 1901, XIV, 62–64.) Brief biographical sketch with bibliography of anthropological publications.

Coelho (T.) O senhor sete. (A Tradição, Serpa, 1901, III, 34–35.) Continuation of article from previous number on the number seven in folk-lore.

Del Greco (F.) La psicopatologia nel complesso delle altre indagini psicologiche. (Riv. di Biol. gen., Torino, 1901, III, 80–101.) A general statement of the phenomena of psychopathology and the problems to be investigated. Constitution, temperament, mind, and character are the four fundamental constituents of human individuality, and the alterations of these form the subjects of psycho-pathological investigation.

Dexter (E. G.) Suicide and the weather. (Pop. Sci. Mo., N. Y., 1901, LVIII, 604–615.) Discusses suicide with relation to monthly distribution, cloudiness, precipitation, temperature, barometer, humidity, wind. According to the author, "suicide is excessive in the later spring months, and upon clear, dry days," i. e., during weather usually considered exhilarating and delightful. To explain this, appeal is made to the hypothesis of "contrast." The statistics relate to Denver and New York.

Durst (J. U.) Notes sur queloues bovidés préhistoriques. (Anthropologie, Paris, 1900, XI, 655–676.) Continuation of a well-illustrated discussion of the *Bovidæ* of the prehistoric world, with numerous references to the literature of the topics treated. The "pure type" of the *Bos brachyceros* is found in Swiss lake-dwellings of the stone age (ca. 2000 B. C.), and was, the author thinks, imported into Europe by "an Asiatic people." The *Bos macroceros* is almost as old as the species first mentioned, of African-Asiatic origin. The *Bos aceratos* seems to have been known in ancient Egypt and in Switzerland in the age of lake-dwellings. These three ancient and widespread species are evidently descended from one ancestor.

Edinger (L.) Brain anatomy and psychology. (Monist, Chicago, 1901, XI, 339–360.) General discussion. Author argues that "a continued study of the psychic behavior of animals with simple actions, and of simple brain construction, will lead to results which will facilitate the problems of human psychology."

Ellwood (C. A.) The theory of imitation in social psychology. (Amer. Journ. Sociol., Chicago, 1901, VI, 721–741.) A critical review of the recent literature of the subject, Tarde and Baldwin especially. The author objects to the theory in question that "it makes the social process something apart from the life-process," while the true standpoint of social psychology must be "one of function—that of a developing life-process." The fundamental fact of all socio-psychological phenomena is "the 'interdependence of function,' which begins in the biological and ends in the ethical stage of human development."

Elting (A. W.) *See* Bardeen.

Engelmann (G. J.) The American girl of to-day. (Amer. Phys. Ed. Rev., Boston, 1901, VI, 28–66.) A discussion of "the status of functional health as determined by modern methods of training, by occupations, mental and physical," illustrated with charts and tables. A bibliography of 60 titles is appended.

d'Enjoy (P.) Le serment à travers les âges et les peuples. (Rev. Scientif., Paris, 1901, 4e série, XV, 369–371.) Brief historical sketch of the oath (Roman, Oriental, Christian). According to the author, "the fear of punishment has been, is, and will be, at all times and among all peoples, the guarantee of testimony."

Ferrero (G.) The evolution of luxury. (Internat. Journ. of Ethics, Phila., 1901, XI, 346–354.) Outline of the development of the superfluous, or luxury, without which man would not differ from the animal. The author recognizes two large, mutually exclusive categories of luxury, the barbaric-esthetic and the civilized-utilitarian, the first aiming more at producing pleasure, the latter at avoiding pain. Luxury evolves contrariwise to religion, morality, art, etc., becoming more and more materialized with progress, and "growing more and more the humble servant of the body, bending itself to pandering to man's lowest needs and almost relinquishing any idea of satisfying the pleasures of his soul."

Fishberg (M.) The comparative pathology of the Jews. (N. Y. Med. Journ., 1901, LXIII, 537–543, 576–582.) A general résumé, with statistics and bibliographical references. Dr Fishberg holds that the peculiarities of the comparative pathology of the Jews "are not due to any ethnic, 'biostatic,' or racial characteristics of a purely anatomical or physiological nature in relation to non-Jews," but have their origin "in the past history of the Jews, in their habits of life, and in the fact that syphilis and alcoholism have but rarely been seen among them." Mingling with Christians, and adopting their customs and habits of life, the Jew "sooner or later loses his 'racial characteristics' and his comparative pathology presents no special peculiarities." Much is accounted for by the fact that the Jew is essentially an urban resident.

Forel (A.) Terminologie und Weltsprache. (Ztschr. f. Hypnot., Leipzig, 1900–01, X, 248–252.) Discusses the need and character of a world-language. Such linguistic grave-diggers as the old French Academy must not be called upon to initiate it,—an academy of caoutchouc is needed. The proposition to use Latin or Greek as an international tongue Dr Forel considers a vain delusion, for language is made for man, not man for language,—and there must be no backward step in evolution. The "Chinese" character of the vocabulary of Volapük, the unphonetic spelling of English, the gender absurdities of French and German (here English shows to great advantage), are not to be imitated. One of the best attempts hitherto at an international language, according to Dr Forel, is that of Dr Julius Lott, of Vienna.

Ganter (R.) Ueber das Tätowiren nach Untersuchungen bei Geistes, kranken. (Allg. Ztschr. f. Psychiatrie, Berlin, 1901, LVIII, 79–114.) Detailed account and discussion of 24 cases (10 %) of tattooing found among 240 psychopaths belonging to the laboring classes, with references to the literature of the subject. The author's conclusion is that tattooing is a "matter of fashion," and not *per se* characteristic of the degenerate, the psychopath, or the sane and sound. Dr Ganter emphasizes the disagreement of statistics as to the prevalence of tattooing.

Greene (D.) The preponderance of male stammerers over females. (N. Y. Med. Journ., 1901, LXXIII, 635–636.) Author attributes this preponderance to the fact that deficient inspiration is a very frequent cause of stammering in males, but a rare one in females. The proportion of stammering caused by mismanagement of the voice is much greater among females, and more obstinate.

Guerri (V.) Processi basilari dell' occipitale. (Anat. Anz., Jena, 1901, XIX, 42–44.) Brief account of the basilar processes in the cranium of a new-born male infant. The condition of the processes supports Livini against Friedlowsky.

Guibert (*Dr*) *et* **Lhuissier** (*Dr*) Évolution mentale et microcéphalie. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1900, 5^e^ sér., I, 182–190.) General account of a microcephalic idiot woman, with details of brain description, morphology, etc., and discussion of relation between state and form of brain and mental aptitude. The subject in question, aged 30 years at her death, may be said to have had "the intelligence of a child not yet out of first childhood." There was atrophy of the frontal and a large development of the parietal lobe.

Jevons (F. B.) The science of religion: its history and method. (Internat. Monthly, Burlington, Vt., 1901, III, 464–494, 550–569.) General discussion of theories, etc., since 1873. Author holds that religion is to be defined by its ideal and not by its accomplishment.

Johnson (G. E.) The condition of the teeth of children in public schools. (Pedag. Sem., Worcester, Mass., 1901, VIII, 45–58.) A general discussion of the subject, with reference to American and European statistics.

Jordan (D. S.) The blood of the nation. A study of the decay of races through the survival of the unfit. (Pop. Sci. Monthly, N. Y., 1901, LIX, 90–100.) The first part "In Peace," of a rather popular essay. "Blood" is taken to cover "the qualities of heredity." The author takes the view that "the evolution of a race is selective only, never collective," — an opinion directly opposed, it may be noted here, to that recently set forth by Professor Karl Pearson,—and "where decadence exists, the noble sires have perished either through evil influences, as in the slums of great cities, or else through the movements of history, or the growth of institutions." France serves as the "fearful example." Various instances of selection of the unfit are cited.

Kohlbrügge (J. H. F.) Stadt und Land. Genealogie und Anthropologie. (Centralbl. f. Anthrop., Ethnol. u. Urgesch., Jena, 1901, VI, 1–10.) A protest against the exaggerated form of the doctrine of the deteriorative influence of town as compared with country life. Dr Kohlbrügge holds that many of the "unfavorable influences of town life" emphasized by Ammon and others, may be only phenomena of acclimatization or accommodation, which, later on, are compensated for by

Kohlbrügge—*Continued.*
other factors. Ammon's deductions from genealogy, the author thinks, are unjustifiable, the real conditions in both country and town having been misunderstood. When townspeople visit the country, it is the change of climate and not the country air that benefits, for if the townspeople settle in the country they are no longer free from cares and disease any more than are their fellows in the towns.

Lasch (R.) Besitzen die Naturvölker ein persönliches Ehrgefühl. Ein Beitrag zur Ethik der Naturvölker. (Ztschr. f. Sozialwissensch., Berlin, 1900, III, 837 ff.) The author agrees with Vierkwndt, that if by "a feeling of personal honor" the virtue of self-respect is meant, it can hardly be conceded to exist among primitive peoples. If, however, by it is meant that which impels the individual to think and act in such wise as to retain the respect of his fellow-men, a concept of honor (evidenced particularly by reasons for suicide) does exist to a certain extent among the lower races of man, though by no means such a social virtue as it is with civilized peoples.

Lee (Alice). *See* Pearson.

Leggiardi-Laura (C.) Di un solco trasverso del lobo parietale, costantemente rappresentato nell' uomo. (Riv. di Biol. gen., Torino, 1901, III, 104-105). Note concerning a sulcus situated on the external face of the cerebral hemisphere, immediately behind and (when well marked) parallel to the postrolandic fissure. This sulcus is constant in man (has been seen in a fœtus of 6 months), is present, but not constantly, in the anthropoids, and is lacking in the lower monkeys.

Lhuissier (*Dr*). *See* Guibert.

Macdonald (A.) The study of man. (Amer. Journ. Sociol., Chicago, 1901, VI, 839-846.) An appeal for "the most neglected of all studies." Methods of investigation are briefly noted and the opinion expressed that children (criminal and abnormal especially) should be studied first. Some two dozen conclusions (anthropological and psychophysical) from recent investigations in various parts of the globe are given, with the wise reservation that they are "to be taken in a *general* sense only," i. e., "are true in *most* of the cases investigated."

Matthews (W.) L'étude de l'éthique chez les races inférieures. (Humanité Nouvelle, Paris, 1901, V, 140-148.) A translation, by Henriette Rynenbroeck, of Dr Matthews' article in the Journal of American Folk-Lore, XII, 1-9.

Méray (C.) Sur les services que peut rendre aux sciences la langue auxiliaire internationale de M. de Zamenhof, connue sous le nom d' *Esperanto.* (C. R. de l'Acad. des Sciences, Paris, 1901, CXXXII, 874-878.) An exposition of the good qualities of the so-called *Esperanto* language, whose adepts now number some 40,000, principally in Russia, Sweden, France, etc. This international language contains only 16 grammatical rules and 17 terminations, and one can learn to read, if not to write it, in a few hours.

Papillault (G.) Essai sur les modifications fonctionelles du squelette. (Rev. de l'École d'Anthrop. de Paris, 1901, XI, 65-86.) Treats, with 4 figures in the text, of the causes of growth of parts of the bony skeleton, the variations in the apophyses, the actions and reactions of the osseous matter of the human body, the auto-regulation existing between bone and muscle, etc. The mandible of an adult *Macacus inuus* and the femur of a chimpanzee are taken as an example to illustrate the thesis in general. The author notes a sort of struggle between the muscular fiber and the periosteum, in which the former has to yield generally, but not equally everywhere. Also a tendency in certain muscles to become fibrous at their fixed ends. A rapid ossification results from immobility and functional excitation.

Patten (A. W.) The archæology of baptism. (Method. Rev., N. Y., 1901, n. s., XVII, 440-451.) Archeological (sculptures, paintings) and historical evidence as to the mode of baptism in the early Christian church.

Pearson (K.) On some applications of the theory of chance to racial differentiation. From the work of W. R. Macdonell and Cicely D. Fawcett. (Philos. Mag., London, 1901, 6th ser., I, 110-124.) Discusses the frequency-distribution of the indices of 1146

Pearson—*Continued.*

French skulls from the catacombs of Paris, 675 Reihengräber skulls from southern Germany, and 114 skulls of ancient Britons. Among the conclusions reached are: Sex differences in the cephalic index are "not sufficiently marked to form a basis for the resolution of unsexed material into its two components"; man evolves largely by the survival of a race rather than mainly by the selection of special types within the race.

—— Mathematical contributions to the theory of evolution, VII. On the correlation of characters not quantitatively measurable. (Philos. Trans. Roy. Soc. Lond., 1901, series A, CXCV, 1–47.) The anthropological sections of these memoirs treat of the chance that an exceptional man is born of an exceptional father, inheritance of eye-color between maternal grandmother and granddaughter, inheritance of stature between father and son, chance of an exceptional man being born of exceptional parents, etc. According to Dr Pearson "exceptional fathers produce exceptional sons at a rate three to six times as great as non-exceptional fathers," and it is only "because exceptional fathers are themselves so rare that we must trust for the bulk of our distinguished men to the non-exceptional class" (p. 38). Moreover, "pairs of exceptional parents produce exceptional sons at a rate more than ten times as great as pairs of non-exceptional parents." This emphasizes the "overwhelming advantage of coming of a good stock" (p. 47).

—— *and* **Lee** (Alice). Mathematical contributions to the theory of evolution. VIII. On the inheritance of characters not capable of exact quantitative measurement. (Ibid., 79–150.) The major part of this paper is devoted to "eye-color inheritance in man." Among the conclusions reached by the authors are: The mean eye-color of man is very substantially lighter than that of woman, the secular change taking place in eye-color is more marked and definite in man than in woman; the maternal male relative is substantially lighter-eyed than the paternal; males are more variable in eye-color, although females seem to spring from more variable stock; the younger generation takes (as a whole) more after its male than its female ascendants and collaterals, and is more highly correlated with an ascendant or collateral of the same than of the opposite sex. The secular change is "very possibly due to a correlation between eye-color and fertility in woman,"—dark-eyed women appear to be more fertile than light-eyed (mothers being darker-eyed than wives), and a dark-eyed element in the population [of England], with a prepotent fertility, is replacing the blue-eyed element. As to assortative mating, the eye-color statistics corroborate its very real character in mankind, as the author previously found for stature. The remarkable degree of likeness between husband and wife shows that "sexual selection is a real factor of evolution, and that we must follow Darwin rather than Wallace in this matter." Another general fact is that "the conclusions arrived at for eye-color in man at no point conflict with those for coat-color in horses, and both in the main accord with the theory of exclusive inheritance without reversion."

Rivers (W. H. H.) Primitive color vision. (Pop. Sci. Monthly, N. Y., 1901, LIX, 44–58.) An admirable summary of our present knowledge, with data from author's personal observations, among the tribes of Torres straits and New Guinea, and from some Singhalese, Tamils, Eskimo, etc., examined by him. Dr Rivers' conclusion is that "whatever room for difference of opinion there may be on the question of the evolution of the color-sense, there can be no doubt that there has been an evolution of color language." The absence of a definite name for blue and brown seems to characterize many primitive languages and is often as marked a feature as possession of terms for red and shades of red. Dr Rivers suggests that the insensitiveness to blue and green on the part of so many tribes may be related to the pigmentation of the retina, but other than physiological factors have also intervened, e. g., lack of interest in the blue and green of nature, the existence of special names, avoiding reference to the color of objects, etc. The phenomena of color evolution in the child, the author thinks, parallel those in the race. Comparing the data as to the color sense of the Melanesians, etc., with

Rivers—*Continued.*
those in the Homeric poems, Dr Rivers says: "One might almost go so far as to say that Homer's terminology for color is in a stage of development which is on much the same level as that of Kiwai, and distinctly less developed than those of Murray Island and Mabuiag." He is also of the opinion that "the views of Gladstone and Geiger cannot be contemptuously dismissed as they were twenty years ago."

Scripture (E. W.) On the nature of vowels. (Amer. Journ. of Sci., New Haven, 1901, 4th ser., XI, 302–309.) Gives an account, with reproduction of curves, of gramophone experiments on American speech. The author concludes that "the movement of the air in the mouth cavity is a free vibration and not a forced one," and that "the cord movements in the vowels are of the nature of explosive openings and not of the usual vibratory form found in most musical instruments." This is inconsistent, apparently, with the theory of the vocal apparatus as a reed pipe.

—— Speech curves. I. (Mod. Lang. Notes, Baltimore, 1901, XVI, 142–158.) An account, with tables and curves, of "how some of the facts contained in a speech-curve may be extracted out of it." Analysis of certain speech-curves.

Sebert (H.) Sur l'utilité scientifique d'une langue auxiliaire internationale. (C. R. de l'Acad. des Sciences, Paris, 1901, CXXXII, 869–874.) Treats of "international language" in general and of *Esperanto* in particular,—to the latter, certain members of the Academy of Sciences, and of other sections of the Institute, have taken more or less kindly of late.

Simons (Sarah E.) Social assimilation. (Amer. Journ. Sociol., Chicago, 1901, VI, 790–822.) This first article deals, in general fashion, with the principles and processes of social assimilation, i. e., "assimilation as a social activity, consciously directed by the state (purposive assimilation)," and treats therefore not of spontaneous assimilation but only of "societies that have produced a civilization." Though not going so far as Gumplowicz and Ratzenhofer, the author holds that "civilized societies arose in consequence of conquest." The process of assimilation is held to be psychological rather than biological, mere mixture of races not being able to produce it. Some "laws" of assimilation are noted, and types indicated.

Snell (M. M.) The liturgic languages and their uses. (Conserv. Rev., Washington, 1901, V, 105–138.) Deals with the church-use of Latin, Greek, Syrian, Coptic, and their extent.

Stuart-Glennie (J. S.) The law of historical intellectual development. (Internat. Monthly, Burlington, Vt., 1901, III, 444–463.) Restatement of the "law" first enunciated by the author in 1873 in his *New Philosophy of History*. According to Mr Stuart-Glennie "the conflict of higher and lower races" was the "main cause of the origin of civilization, and determined also the origin of intellectual development."

Swift (E. J.) Some criminal tendencies of boyhood. (Pedag. Sem., Worcester, Mass., 1901, VIII, 65–91.) General discussion of criminal aspects of adolescence. The author holds that in the individual race-instincts have a right to exist," and that "instead of antagonizing them we should use them in developing the child."

Thomas (W. J.) The gaming instinct. (Amer. Journ. Sociol., Chicago, 1901, VI, 750–763.) Taking the view that "there has been comparatively little change in human structure or human interest in historical times," and that human instincts are congenital and instinctive activities pleasurable, while individually acquired habits are irksome, the author looks on the gambler as representing a class of men "not weaned from their instincts." Gambling is "a means of keeping up the conflict interest and of securing all the pleasure-pain sensations of conflict activity with little effort and no drudgery." The gambling instinct is born in all normal persons. The social evolution of the "conflict interest" and its *rôle* among primitive peoples are considered.

Virchow (H.) Ueber das Skelet eines wohlgebildeten Fusses. (Arch. f. Physiol., Leipzig, 1901, Verh. d. Berl. physiol. Ges., 174–183.) Discusses with some detail (four figures in the text) the foot of a woman of 40 years of age.

Wiedersheim (R.) Dell'organo uditivo. (Riv. di Biol. gen., Torino, 1901, III, 161–198.) General anatomical and physiological account of the ear and its development (illustrated with 37 figures in the text) in man and the lower animals.

Wilson (L. N.) Bibliography of child-study for the year 1899. (Pedag. Sem., Worcester, Mass., 1901, VII, 526–556.) Contains many anthropological titles.

Witort (J.) Filozofia pierwotna. (Lud, Lwów, 1901, VII, 1–28.) General discussion of animism, continued from last number. Chiefly based on Tylor.

Zaborowski (M.) Portraits d'hommes tatoués. (Bull. et Mém. Soc. d'Anthr. de Paris, 1900, 5^{e} sér., I, 170–172.) The author emphasizes ennui as a factor in the inspiring of the tatooing habit, especially with criminals, soldiers, sailors. The prison and the barracks rather than an innate criminal tendency come into play.

Ziehen (T.) Ueber vergleichend-anatomische Gehirnwägungen. (Monatsschr. f. Psychiatrie und Neurol., Berlin, 1901, IX, 316–318.) Enumerates the conditions desirable in brain-weighing.

EUROPE

Alexander (Harriet C. B.) Malthusianism and degeneracy. (Alien. und Neurol., St Louis, 1901, XXII, 112–137.) General discussion. England and France are compared with respect to old men marrying young wives and old women marrying young husbands.

Almgren (O.) De nyaste forskningarna om bronsålderns början i norden (Ymer, Stockholm, 1900, XX, 395–422.) Chiefly a review and résumé of Montelius' recent study on "The Chronology of the Old Bronze Age," with many figures in the text, reproduced from that work.

Balliot (M.) Les tumulus d'Essey-les-Eaux, Haute-Marne. (Rev. de l'École d'Anthrop. de Paris, 1901, XI, 87–91.) Describes (with 6 figures in the text) the finds (bracelets, necklaces, bronze and iron rings, an iron poignard, fibulæ, etc.) in four tumuli (Gaulish sepulchres) at Essey-les-Eaux, in the department of Haute-Maine. On a disk at the end of one of the fibulæ is a symbolic image of the sun, the same as one noted on a stele of the Iron age from near Bologna in Italy.

Barblan (G.) Costüms, üsanzas, modas e festas popularas in Engiadina bassa. (Ann. d. Soc. Reto-rom., Chur, 1900, XIV, 159–200.) Treats of popular customs, usages, and folklore of the Lower Engadin, relating to birth, baptism, confirmation, marriage, sickness, death, the numerous yearly festivals, etc.

Beltz (R.) Erläuterung der Karten zur Vorgeschichte von Mecklenburg. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1901, XXXII, 10–16, 20–23.) First and second portions of a general discussion of the cartographic representation of the results of prehistoric research in Mecklenburg in particular. Nature, size, colors of map, signs to indicate monuments and other remains, terminology, etc., are considered, and the various periods and the finds corresponding indicated. The author favors as few and as simple signs as possible. The maps published by Dr Beltz deal with the various "ages" (stone, bronze, iron), and the article résumés the facts recorded on them, the history of Mecklenburg since the early Stone age when an ancient fisher-folk possessed the land.

—— Alterthümer aus der Uckermark und aus Hinter-Pommern. (Verh. d. Berliner Ges. f. Anthrop., 1901, 411–413.) Brief account of the contents of urns discovered at Zarnekow, near Bublitz.

Boekenoogen (G. J.) De Dorhoed. (Volkskunde, Gent, 1900–01, XIII, 65–77, 161.) Treats of the use of the straw-hat, straw-wreath, straw-doll, etc., as a punishment and in connection with weddings, etc., in various parts of Belgium and Holland. A "straw-man" was sometimes placed on the roof of the house, or attached to a tree or some other object nearby, when a young wife had proved false to her marriage vows, or when some maiden or youth proved unchaste. Some interesting popular verses referring to these customs, now almost obsolete, are given.

—— Nederlandsche sprookjes en vertelses. (Ibid., 111–121, 168–172, 193–205.) Dialect texts with a few notes, references to literature, etc., of seven Dutch folktales.

Bouchereau (*Dr*) Recherches sur l'ethnographie du plateau central de la France. (Anthropologie, Paris, 1900,

Bouchereau—*Continued.*
XI, 691–706.) Discussion, with brief historical introduction and statistics, of the color of the hair and eyes of the inhabitants of the central plateau of France in relation to age, sex, stature, cephalic index, demographic factors. The color of the eyes is more stable than that of the hair; sex seems to exert little influence, though women generally have not such dark hair as men; stature is too variable here for close correlation; brachycephaly seems to go with a degree of nigrescence above the average. In Auvergne the brunette element is on the gain, especially in the towns. Blonds are more subject to certain fatal diseases (tuberculosis especially), and are losing ground. The ability of the brunette to "mix well" is one of the factors in his favor.

Capitan (L.) Chronique préhistorique. (Rev. de l'École d'Anthrop. de Paris, 1901, XI, 91–96.) Describes (after M. Bottin), with 7 figures, some rock engravings in certain caves at Ollioules, in the department of Var, southeastern France. Resemblances with some of the Mycenian alphabetic signs are suggested for some of the figures.

de Cock (A.) De Doode te gast genood. (Volkskunde, Gent, 1900–01, XIII, 77–81.) Treats briefly of "death as guest" in Belgian, French, Teutonic, Chinese, Spanish ("Don Juan") folklore.

—— Spreekwoorden en zegswijzen over de vrouwen, de liefde en het huwelijk. (Ibid., 84–87, 122–123.) Numbers 187–227 of Belgian proverbs relating to women, love, marriage, with notes.

—— Spreekwoorden en zegswijzen afkomstig van oude gebruiken en volkszeden. (Ibid., 151–160, 185–186.) Numbers 344–354 of proverbs relating to old folk-customs, etc., with detailed explanations and references to literature. The present articles concern proverbs and folk-sayings about wooing and weddings, children, etc.

Colson (O.) Fétichisme. (Wallonia, Liège, 1901, IX, 24–35.) Discusses the "free religion," which appears (with the people) alongside the sacerdotal, the popular practices existing but ignored generally by the religious authorities,—the "fetichistic" element in Belgian folk-religion. Among the topics touched are particularistic faith, naïve oaths and anathemas, statue-animism, secret customs of lovers. Interesting examples are given of this *barbarie ambiante.*

Courthion (M. L.) Coutumes de la vallée de Bagnes. (Schweiz. Archiv. f. Volkskunde, Zürich, 1901, V, 47–49.) Brief notes about Palm Sunday, St Agatha's Day, Easter Eve, death, betrothal, marriage, New Year's Day, etc.

Dikarev (M.) Programa do zbiranya vidomostei pro gromadĭ i zbirki silskoi molodi—vulitzyu, vetchernitzi, dośvitki i skladki. (Mater. Ukrain.-rusk., etnol., Lviv, 1900, III, Dodatki, 1–27.) A *questionnaire* compiled by the late M. Dikarev on societies and reunions of both sexes among the peasantry. There are 201 questions with general introduction. Meetings on the street, *vulitzyu* evening meetings (*vetchernitzi*), morning-meetings (*dośvitki*), etc., are considered. The introduction contains the opinions of the author on the subject and its bearings.

Drechsler (*Dr*) Beiträge zum Schlesischen Wörterbuche. (Mitt. d. Schles. Ges. f. Volkskunde, Breslau, 1900, VII, 61–71; 1901, VIII, 8–15.) Interesting list of Silesian German words with explanatory notes. The origin of the term *Jandar*, used for the devil, from which is derived the adjective *jandarsch*, does not seem to be known.

Ellis (H.) A study of British genius. (Pop. Sci. Monthly, N. Y., 1901, LIX, 59–67.) This fifth section of Mr Ellis' study treats of the childhood and youth of British geniuses. Among the topics discussed are constitutional delicacy, precocity, influence of education, residence abroad, etc. Noteworthy are the many instances in which "the delicate infant develops into a youth or a man of quite exceptional physical health and vigor," as well as the longevity of men of genius of very feeble health. As to precocity (properly defined), the author holds that "it is its absence rather than its presence, which ought to astonish us in men of genius." The diverting, by some powerful external impression, of the physically precocious into the notably great in morals and force of character, is by no means uncommon. A "decidedly large" proportion of British men of genius (53 % have been at some university) have enjoyed the

Ellis—*Continued.*
advantages of university education, but the exact nature of this factor in the development of their eminence is uncertain. Certainly the wide dissemination of the sources of knowledge today has made university education no absolutely necessary factor and also minimized its general importance. Residence in a foreign country during early life seems to be of "very decided significance."

Gallée (J. H.) Sporen van Indo-germaansch ritueel in Germaansche lijkplechtigheden. (Volkskunde, Gent, 1900–1901, XIII, 89–99, 129–145.) Treats, with some detail and references to the literature of the subject, the "remains of Indogermanic rites and customs in the Teutonic funeral ceremonies." Among the topics discussed are the "death-shirt," wake, funeral-bread, corpse-straw, litter, funeral-ale, incineration, burial customs (thirty items are enumerated), etc. The author considers most of these folk-customs "inheritances from Indogermanic times."

Gnatyuk (V.) Etnografichni materiali z Ugorskoi rusi. I. Zachidni Ugorsko-Ruski Komitat. II. Bach-Bodrogski Komitat. (Etnogr. Zbirnik, Tovar. Ševtchenka, Lwów, 1900, IX, iv + 284.) The first part (pp. 3–116) of this collection of folk-literature made by V. Gnatyuk from the western Hungarian-Ruthenian country consists of fifty-six items of folktales and three of folksongs from the villages of Čertež, Šambron, Sulyn, Lipnik, Orjabyna, Svydnyk, Litmanova, Jakubjany, Krenpach, Kružljova, and Malzow, in the counties of Zemplin, Šaroš, Zips. The second section consists of 420 folksongs from the county of Bač-Bodrog; of these 17 are spiritual and Christmas songs, 20 ballads and romances, 9 historical reminiscences, 12 songs of different fates, 115 girls' songs, 15 songs relating to loss of virginity, 83 bachelors' songs, 39 soldier's songs, 48 songs of married life, 46 local songs, 11 jesting and satirical songs, and 10 beast-epic songs. The parallels in cognate folk-literature, where known, are indicated.

—— Tkatztvo u stchidniĭ Galitchini. (Mater. Ukrain-rusk. etnol., Lviv, 1900, III, 12–26.) Treats, with 2 plates containing 17 illustrations of weaving in eastern Galicia, the processes, implements, etc., connected therewith. Every stage of manufacture is noted, the instruments described and figured. Pages 24–25 contain lists of technical terms relating to the loom in use in various parts of the country. The region of Maramorosch, in Hungary, is also referred to; and here certain modifications of the machinery have been made by the weavers.

Götze (A). Depotfund, von Eisengeräthen aus frührömischer Zeit von Körner, Sachsen-Coburg-Gotha. (Ztschr. f. Ethnol., Berlin, 1900, XXXII, 202–214.) Describes, with 66 figures, the iron swords, spears, domestic utensils, implements, rings, nails, bars and bands, hooks, etc., found in a big-bellied pot at Körner, near the Thuringian town of Mühlhausen, where a railway cutting had been made. The find dates from about the first century A.D., but some of the remains suggest La Tène.

—— Die Steinsburg auf dem Kleinen Gleichberge bei Römhild, Sachsen-Meiningen. (Verh. d. Berliner Ges. f. Anthrop., 1900, 416–427.) Describes, with 10 figures in the text, the prehistoric fortification of the Steinsburg, which the author regards as a construction of the first rank and of great importance. It probably dates from *ca.* 400 B.C., and was perhaps a last stronghold of the Kelts against the Teutonic invaders of Thuringia.

—— Neue Erwerbungen des Königlichen Museums für Völkerkunde. (Ibid., 427–429.) Describes briefly a bronze ring, an axe of nephrite, a bone spindle, and a find of amber (at the mouth of the Weser), from various parts of Germany.

Gumplowicz (M.) Polacy na Węgrzech. (Lud, Lwów, 1901, VII, 74–78.) Continuation from a previous number of a historical, ethnographical, and statistical study of the Poles in Hungary.

Guszman (J.) Beitrag zur Morphologie des Gehirnoberfläche. (Anat. Anz., Jena, 1901, XIX, 239–249.) Description, with 7 figures of the brain of Rudolph Lenz, a young musician, said to have been the best pupil of Joachim. The brain, when no longer quite fresh, weighed 1,636 gr., and the parietal

Guszman—*Continued.*
lobes (the right hemisphere especially) exhibited rather marked variations from the normal. The author is conservative in opinion, and seems to agree with Eberstaller that the abnormal developments (quantitative and qualitative) occur in those regions of the brain which are still in process of evolution—the lower vertical lobule and the lower frontal convolution.

Helm (O.) Ueber die chemische Analyse vorgeschichtliche Bronzen aus Velém St Veit in Ungarn. (Verh. d. Berliner Ges. f. Anthrop., 1900, 359–365.) Results of chemical analysis of nine specimens, of which five are casting-lumps, etc. Most of the specimens contained a considerable amount of antimony and some are evidently the results of experiment in mixing metals, so remarkable is their composition. The antimony was probably obtained from copper-ore containing that metal. The find at Velém St Veit is one of the richest and most interesting on record.

Ireland (W. W.) Friedrich Nietzsche: a study in mental pathology. (Alien. and Neurol., St Louis, 1901, XXII, 223–267.) A very unsympathetic attempt "to consider Nietzsche as a case of mental pathology and to trace the steps of the descending process to the dénouement."

Kellner (*Dr*) Ueber Kopfmaasse der Idioten. (Allg. Ztschr. f. Psychiatrie, Berlin, 1901, LVIII, 61–78.) Results of head-measurements of 220 idiots (98 female) more than 25 years of age in the Hamburg Asylum at Alsterdorf. As compared with the "physiological norm" (Benedikt's figures are increased 6%), the author finds many variations—13 % of the idiot heads are abnormal as to greatest breadth, 41 % as to height, etc., the latter seeming to be a factor of considerable influence.

Kühnau (*Dr*) Die Bedeutung des Brotes in Haus und Familie. (Mitt. d. Schles. Ges. f. Volkskunde, Breslau, 1901, VIII, 25–44.) An interesting and valuable account of folk-thought about bread in relation to the house and the family in various parts of Germany. Widespread is the idea that the fortune or luck of the house is bound up with bread; men and animals are related to a new house through bread; to lose bread in transit to the new house is unlucky; bread appears in connection with love-charms, betrothals, marriages, birth, baptism, etc., and with it many superstitions are connected. Dr Kühnau thinks the vegetative life of the fields of grain is the source of the bread-cult, and there is a close analogy often in folk-thought between bread and human generation, so it is natural enough to find bread figuring so largely in wedding-symbolism and what precedes and what follows marriage. In early times baking had something religious about it, as dough-figures of sacred personages still indicate.

de Lazarque (A. A.) Usages et superstitions populaires de la Lorraine. (Rev. d. Trad. pop., Paris, 1901, XVI, 12–24.) Enumerates many items of folklore relating to human life (baptism, marriage), the festivals of the year, trades and callings, domestic animals, the moon, the weather, etc. Worth noting is *wairpone* ("the bar of the setting"), the name given to the black horizontal band of clouds, seen when the sun disappears in setting, and looked upon as a sign of rain or storm.

Leach (Abby) The Athenian democracy in the light of Greek literature. (Amer. Journ. Philol., Baltimore, 1900, XXI, 361–377.) Enumerates and discusses opinions of Greek writers on the Athenian democracy,—the Sicilian expedition, education, etc.

Ledieu (A.) Blason d'Abbeville. (Ibid., 53–56.) Enumerates popular sayings about and jests at the expense of the inhabitants of Abbeville in the department of the Somme. A special variety of the people of Abbeville are known as *Baboliens*, and have been humorously "written up" by one of the local poets.

Lissauer (A.) Anthropologische Bericht über meine letzte Reise in Süd-Frankreich und Italien. (Verh. d. Berliner Ges. f. Anthrop., 1900, 401–411.) The topics treated are: The rock-sculptures of Monte Bego, the *Balzi rossi* near Mentone, the Ligurian stone-walls (or Castéu) of the region of the Maritime Alps, the Ligurian element in the Rhine valley, the dolmen of Dragnignan (a good picture is given), and the Etruscan necropolis of Orvieto. The rock-sculptures seem to indicate that the pass over the Col di Tenda was

Lissauer—*Continued.* used in the bronze age. From the remains of Roman origin found in connection with them, the stone walls seem to have been used by a neolithic population up to within the period of Roman occupancy. That the Ligurians spread into the Rhine valley is very doubtful.

Litvinova-Bartoš (*Mrs* P.) Vesilini obryadi i zvitchai u seli Zemlyantzi Gluchioskogo prov. u Tchernigivstchini. (Mater. Ukrain.-rusk. etnol., Lviv, 1900, III, 70–173.) Details, with 12 figures, the nuptial rites and ceremonies in use today in the village of Zemlyanka, district of Gluchov, government of Tchernigov, and gives the text of many songs connected with the wedding. Among the topics discussed are wooing, bread-exchange, betrothal, marriage, holy tree, holy bread, processions and songs, treatment of bride and bridegroom, nuptial orgies, doings of the guests, marriages without religious rites, etc. It is an interesting fact that the holy bread and wedding-cake are either in the form of a fir-cone (phallic symbol) or have some ornamentation of that sort.

Marriage (*Miss* M. E.) *and* **Meier** (J.) Volkslieder aus dem Kanton Bern. (Schweiz. Archiv f. Volkskunde, Zürich, 1901, V, 1–47.) First section of an extended essay. The text and music of 72 songs are given, also the first line of 69 others. These songs were obtained from Mrs Künzi, of Bern. References to the literature of the subject are given.

Nicolet (C.) Le carnaval de Ster-Francor-champs en Ardennes. (Wallonia, Liège, 1901, IX, 14–22.) Brief descriptions of the festivities, etc., on four *crâs-jeudis* (jeudis gras), the *rôle* (a species of Walloon buffoonery), the *groumotte* (children's begging), the *vèheu* (something akin to the *groumotte*), the burning of the *makralle* (straw man), and the *grand-feu*. It is thought that the village failing to have its *grand-feu* will suffer during the year from a conflagration.

Novicow (J.) The Russian people: A psychological study. (Internat. Monthly, Burlington, Vt., 1901, III, 359–410.) Treats of race and temperament, general psychology, sentiment, intellect, politics, present state of the people. The essay is confined to the so-called "Great Russians," the most important of the more than sixty-five independent racial groups contained in the empire. The history of Russia is the reverse of that of the United States of America (where the Aryan has been pushing on from east to west) and the "Far West" of America has its counterpart in the "Far East" of Siberia. Like the people of the United States, too, the Russians are very mixed in race. The prevailing temperament is the lymphatic, and the prevailing type a mixture of Slav and Finn. Inequality of effort (the result of historical circumstances), abounding good nature, inequality of character, a large share of melancholy and sadness (due to history even more than nature about them), generosity, cordiality of social intercourse, and a lack of the systematic temperament generally are some of the chief characteristics of the Russian people. The absence of great philosophers in Russia may be due to the fact that the thought of that country matured after the construction of great philosophical systems had been abandoned, though censorship of the press may count for something. Christianity, Novicow thinks, is only a veneer and has entered very little into the Russian soul, though tormented to its very depths by a great religious need. Autocracy is a comparatively recent fact in Russia, and it survives because a large number of Russians (from considerations of historical circumstances) consider it "beneficial for their country as a whole"—this idea is enforced, too, by the general mysticism and likewise by the doctrine of Panslavism. But beneath it all lies the democratic tendency of the Russian people, who at the present time "are going through the dullest and most spiritless period of their history." That democracy will win sometime, is certain.

Oehl (W.) Kinderreime aus Grulich. (Mitt. der Schles. Ges. f. Volkskunde, Breslau, 1901, VIII, 16–22.) Dialect texts of some 66 children's rhymes from Grulich in Silesia.

Olbrich (*Dr*) Aal und Schlange. (Ibid., 1–3.) Items of folklore from Silesia, etc., concerning the eel and its likeness to the snake. Many superstitions have been transferred from the latter to the former.

Penrose (F. C.) Some additional notes on the orientation of Greek temples, etc. (Proc. Roy. Soc., London, 1901, LXVIII, 112–114.) Notes, with plan of newly-discovered temple of Selinus in Sicily, of observations on two Greek (Delos, Delphi) and four Sicilian temples, made during April and May, 1900. This paper appears also in Nature, 1901, LXIII, 492–493.

Pfitzner (P.) Ueber den Urnen-Friedhof bei Beutnitz, Kr. Crossen a. O. (Verh. d. Berliner Ges. f. Anthrop., 1900, 367–375.) Account, with map and many figures in the text, of the rich discoveries of urns, etc., near the village of Beutnitz.

Piette (É.) Classification et terminologie des temps préhistoriques. (Centralbl. f. Anthrop., Ethnol. u. Urgesch., Jena, 1901, VI, 65–68.) A table showing the epochs, ages, periods, etc., of prehistoric Europe, with their chief general characteristics.

Reinecke (P.) Statistik der slavischen Funde aus Süd- und Mitteldeutschland. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1901, XXXII, 17–20.) Lists, with map, the places where graves, embankments, and other remains of Slavic origin have been found in central Franconia, upper Franconia, upper Palatinate, and Thuringia. A great part of these Slavic remains belong to the younger period (*ca.* 1000 A.D.)

Retzius (G.) Das Gehirn des Mathematikers, Sonja Kovalevski. (Biol. Untersuchg., 1900, N. F., IX, 1–16.) Detailed description, with 4 plates and a portrait, of the brain of Madame Kovalevski, the mathematician, the first brain of a woman of mathematical talent to be scientifically studied. The most noteworthy peculiarities are met with in the *Lobulus parietalis inferior*, and the *Gyrus supramarginalis* is remarkably developed. Some interesting comparisons suggest themselves between the brain of Madame Kovalevski and those of Helmholtz and Gyldén (the astronomer); the last was studied by Retzius in 1898.

Rozdolski (O.) Galitchki narodni noveli. (Etnogr. Zbirnik, Tovar. Sevtchenka, Lwów, 1900, VIII, ix + 1–166.) Contains, with an introduction and bibliography (pp. vi–ix) by Dr Ivan Franko, the texts of 81 Galician folktales collected by Joseph Rozdolski. There is also an index of the more important *motifs*.

Rutot (A.) Sur la distribution des industries paléolithiques dans les couches quaternaires de la Belgique. (Anthropologie, Paris, 1900, XI, 707–746.) A detailed discussion, with 27 figures of implements, of the remains of human industry (flints, etc.) in the Quaternary deposits of Belgium. In the discussion of this paper, at the International Congress of Prehistoric Anthropology and Archæology, considerable difference of opinion as to the human origin of some of these flints (now in the Brussels Museum of Natural History) was developed. The author of the paper is a geologist and is absolutely convinced of their genuinely human provenience.

Sabbe (M.) Eenige Brugsche volksliederen. (Volkskunde, Gent, 1900–01, XIII, 186–193.) Variants and additions to tales in the collection of Lootens and Feys. The tale *Isabelletje* here given does not occur in that storehouse of Bruges folk-narrations.

Schrijnen (J.) De vogel op den palmpaasch. (Ibid., 104–110.) The author regards the bird on the Belgian *palmpaasch*, or Easter palm-branch — a mingling of heathen and Christian ideas —as related to the weather-cock (bird-warder against storm, etc.) and the bird on the tree of life in the older Teutonic mythology.

Sébillot (P.) Géographie légendaire d'un canton. (Rev. d. Trad. pop., Paris, 1901, XVI, 1–6.) The author presents a sketch-map of his native canton of Matignon, in Brittany, on which are indicated sea-grottos (inhabited by fairies); haunted places; musical rocks; submarine castles, vessels, forests; marks and creations of Gargantua, the saints, etc.; fairy and other fountains and springs; megalithic monuments; legendary chapels, crosses, places, etc.; haunted castles, and the like. In all eighty-eight items are shown, the map covering an area of 20 by 15 kilometers.

—— Mégalithes cités par les auteurs antérieurs à ce siècle. (Ibid., 42–45.) Notes that fourteen megalithic monuments are referred to in Ogée's *Dictionnaire de Bretagne*, the first edition of which appeared in 1778–80. Other early notices of monuments outside Brittany are referred to.

Senf (*Dr*) Ueber Bronze-Nadeln von auffälliger Spitzigkeit, u. s. w. (Verh. d. Berliner Ges. f. Anthrop., 1900, 376–381.) Describes, with six figures in the text, some very finely pointed bronze needles and other remains from several places in northeastern Germany.

Stückelberg (E. A.) Notizen aus dem Urserenthal. (Schweiz. Archiv f. Volkskunde, Zürich, 1901, V, 50–60.) Notes on façades of houses, fireplaces and their inscriptions, wall-ornaments, etc. An interesting occurrence in September is the "marmot hunt." Ursern valley, in the Canton of Uri, gets its name from the bear (L. *ursus*), and, like Orsières in Valais, served to replenish the Roman amphitheaters with their brute victims.

Veretelnik (A.) Rusane i vigotovlyuvane dereva. (Mater. Ukrain.-rusk. etnol., Lviv, 1900, III, 27–32.) Treats, with 2 plates containing 16 figures, of wood-cutting and lumbering in the forests of the Kamenetz district (government of Podolia) near the Austro-Hungarian frontier. The tools are figured and the technical terms recorded.

Vital (A.) Chanzuns popularas ladinas. (Ann. d. Soc. Reto-rom., Chur, 1900, XIV, 201–280.) Continued from vols. XI and XII. A valuable and interesting collection of folksongs from the Engadine.

Vovk (T.) Znatchidki u mogilach mizh Veremem i Stretivkoyu i bilya Tripilya. (Mater. Ukrain.-rusk. etnol., Lviv, 1900, III, 1–11.) Gives an account, with a plate and 11 figures, of the finds made in 1897 in five graves and *kourgans* near Veremje and three near Tripille, in the government of Kiev. In one of the latter, besides amber and bronze ornaments, there was discovered what the author considers a statuette of a phallic deity, which is figured.

Walz (J. A.) The folk-lore elements in Hauptmann's *Die Versunkene Glocke*. (Mod. Lang. Notes, Baltimore, 1901, XVI, 89–105, 130–142.) A critical analysis, with copious bibliographical notes, of the folklore elements in this famous "fairy play." The author holds that "the poet is far more indebted to German folk-lore than to all the works of literature combined."

van Werveke (A.) De ontucht in het oude Gent. (Volkskunde, Gent, 1900–01, XIII, 100–104, 146–150.) Notes on libertinage in Ghent in the last four centuries.

Winslow (E. D.) The Lapps of Sweden. (Bull. Amer. Geogr. Soc., N. Y., 1900, XXXII, 430–431.) Brief general account. Notes the intrusion of civilized races as disturbing the reindeer-hunting of natives.

Zaborowski (M.) Les Portugais d'après des photographies. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1900, 5e sér., I, 231–233.) From a study of 36 portraits of Portuguese the author finds confirmation of the conclusions of physical anthropology. The Moor-Berber-Egyptian element in the Portuguese population is clearly noticeable in these photographs.

Zubritzki (M.) Narodniĭ kalendar. (Mater. Ukrain.-rusk. etnol., Lviv, 1900, III, 33–60.) Treats, with some detail, of folk beliefs and customs relating to the days of the week, festivals and holidays of the year, etc.

AFRICA

Berthelot (M.) Sur les métaux égyptiens: Présence du platine parmi les caractères d'une inscription hiéroglyphique. (C. R. d. l'Acad. d. Sci., Paris, 1901, CXXXII, 729–732.) Records the discovery of a piece of platinum (the first reported from ancient Egypt) as part of the silver working on a metal plaque from Thebes, dating from about the seventh century, B. C. The author does not credit the ancient Egyptians with any knowledge of the metal and its qualities.

Binet (E.) Observations sur les Dahoméens. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1900, 5e sér., I, 244–253.) General ethnographic sketch—manners and customs, food, marriage, religion, medicine. The section on medicine and diseases occupies pages 249–251, the names of many native remedies and the method of their employment being recorded. The Dahomeans in question (4 adults, a woman, and a boy) formed part of the exhibit from French Dahomey at the Paris Exposition.

Coutière (H.) Histoire naturelle de la mer Rouge. (Rev. Scientif., Paris, 1901, 4^e sér., XV, 417–426.) Contains some remarks on the Danakils, Somâl, etc.

Crosby (O. T.) Abyssinia—the country and people. (Nat. Geogr. Mag., Washington, 1901, XII, 89–102.) Notes of travel in 1900. Menelek, the people, and their future (absorption by Britain ?) are discussed.

Delafosse (M.) Sur des traces probables de civilisation Egyptienne et d'hommes de race Blanche à la Côte d'Ivoire. (Anthropologie, Paris, 1900, XI, 677–690.) The concluding section of his study of Egyptian influences on the Ivory Coast of West Africa. Ancient graves and their contents are described, and the author finds proof of Egyptian influence in the beads, bronze vases, etc., from Guiangomênou, where perhaps Egyptians have been buried. He also inclines to believe in the existence at present of an ethnic island of whites somewhere in the midst of the negro population of this region. The Egyptian influence in West Africa has been largely exerted indirectly through the Houssa.

Hamilton (F.) Rough notes on native tribes of South Africa. (Archæol. Rep. Ont., Toronto, 1900 [1901], XII, 40–49.) Notes on certain aspects of native life and on specimens collected for the Provincial Archeological Museum by the author in South Africa. The chief tribes treated are the Barolongs and Basutos. Mr Hamilton remarks that the Boers have adopted several things from the aborigines,—a method of tanning, stone hen's nests, rounded courtyards, etc. The kraals of the Basutos seem to be situated at some distance from water, a hygienic precaution, perhaps. The author notes also "the cleanliness of the Basuto and Barolong huts and kraals, so far as I observed them."

Hartland (E. S.) Presidential address. (Folk-Lore, London, 1901, XII, 15–40.) The chief part is devoted to the consideration of South African (Zulu, Bechuana, etc.) primitive religion. The Morimo of the Bechuana, Mr Hartland is inclined to look upon "not as a once supreme deity fading away, but as a god in process of becoming." Of the Zulu figure the same may be said: "*Tilo* [in Baronga] or ***inkosi pezulu***, thus, like the *Ngai* of the Masai, like the Malagasy ***Andria-manitra***, like the Siouan ***wakanda***, is found to be theoplasm, god-stuff, not a god fully formed and finally evolved. It is a god, or gods, in the making, not a god with one foot in the grave." The worship of the dead among the Zulus, the author thinks "is not in any sense of the word a primitive institution," nor are the Zulus themselves really a primitive people. The only branches of the Bantu race among whom "no certain traces of totemism and but few of mother-right are found," are the Amazulu and certain allied tribes, the most advanced of all the Bantu stock. Among the Bechuana "very substantial remnants of totemism" are found, also traces of mother-right. According to Mr Hartland the development of the patriarchal system is what has caused ancestor-worship to supplant totemism. The address contains also brief references to recent deaths of folklorists, criticisms of Mr Marett's paper, and an appeal for the organized study of South African folk-lore.

Rodes (J.) Une colonne au Soudan. (Nouv. Rev., Paris, 1901, N. S., X, 134–141.) Contains some references to Babemba of Sikass and his people.

Schurtz (H.) Zaubermittel der Evheer. (Internat. Archiv f. Ethnogr., Leiden, 1901, XIV, 1–15.) Describes in detail with 4 plates (41 figures) the collection of *materia magica* in the Bremen City Museum from the Ewe of the Slave Coast of West Africa. This collection, due to C. Spiess, a German missionary in the region concerned, embraces priests' tablets, seats, amulets, axes, staffs, fetish-women's bags, bracelets, human figures of wood, idols, rings, etc. As far as possible the native names of the objects and their meanings are given. Perhaps the most interesting of all are the numerous and multiform magic knots. The author notes the *rôle* of compression, knotting together, etc., in primitive "magic."

Schweinfurth (G.) Einige von der freien Natur Südwest-Afrika's dem Naturmenschen dargebotene vegetabilische Nahrungsmittel. (Verh. d. Berliner Ges. f. Anthrop., 1900, 354–359.) Account of specimens of bulbs, roots, fruits, etc., collected in 1898 by Major

Schweinfurth—*Continued.*

von Wissmann in the Otschitno district of German Southwestern Africa, east of Grootfontein, and known to be used as food by the Bushmen of the country. Among the chief food-plants here noted are: *Omunguntil* (a species of *Capparidæ*), *otjimakd* (a species of *Bauhinia*), the wild watermelon, several berries and bulbous roots, which are roasted or dried.

Staudinger (P.) Rothfärbung der Schädel und des Körpers in Africa. (Ibid., 347.) Notes the occurrence of coloring the skull red in the Niger-Benüe region.

Wiese (C.) Beiträge zur Geschichte der Zulu im Norden des Zambesi, namentlich der Angoni. (Ztschr. f. Ethnol., Berlin, 1900, XXXII, 181–201.) The author claims to be the only European of long residence among the Angoni, whose chief is Mpesene. After a brief historical sketch of the tribe, notes about language, government, marriage and the position of women, death and burial, clothing, ornament, war and kindred matters, religion, ceremonial, and some minor habits and customs are given. The Angoni speak two different languages, the Angoni proper (a Zulu dialect), the national, literary speech, and the Senga, which, although the tongue of the Senga, a people partly subjected by the Angoni, is also the common speech of the latter. Of the national songs of the Angoni the author tells us, "they are very harmonic and remind one of English hymns." The share his donkey took in mourning at a funeral is evidence of the *naiveté* of these people (p. 193). The direction of a new dwelling-place for the tribe is determined from the way in which a cow, one of whose hindquarters has been amputated, seeks to go. The Angoni never eat fish, and are very loth to cross large streams. Another striking custom among them is that parents kiss their children on both cheeks, something rare in native Africa.

Zaborowski (M.) De l'origine des anciens Égyptiens. (Bull. et. Mém. Soc. d'Anthrop. de Paris, 1900, 5e sér., I, 212–221.) General discussion of the question of Egyptian origins, with special reference to the publications of Sergi, Chantre, De Morgan, etc. M. Zaborowski no longer holds to the homogeneity of the prehistoric Egyptians. He continues, on the other hand, to advocate the African origin in general of the civilization of the Nile.

ASIA

Adler (C.) *and* **Casanowicz** (I. M.) Descriptive catalogue of a collection of objects of Jewish ceremonial deposited in the U. S. National Museum by Hadji Ephraim Benguiat. (Rep. U. S. Nat. Mus., 1899 [1901], 539–561.) This interesting and well-illustrated (there are 36 good plates) catalogue enumerates descriptively 62 objects and articles of a ceremonial sort,—objects used in the synagogue-service, at prayer, on festal occasions (Sabbath, passover, etc.) at the Jewish home, on special occasions; miscellaneous objects (medals, etc.); objects (chiefly textile) illustrative of Biblical narratives.

B. (M.) Zhite na viru u Sibirskich selyan. (Mater. Ukrain.-rusk. etnol., Lviv, 1900, III, 61–69.) Discusses the relative freedom in sexual relations among the Siberian peasantry, where the "union libre" (7½ per cent. of all families) is adopted to avoid the expenses incident upon marriage. The absence of ancient traditions and the weakness of social and legal restraints favor this. The proportion of these unions varies from 3 to 17 per 100 families.

Basset (R.) Le marchand et le génie. (Rev. d. Trad. pop., Paris, 1901, XVI, 28–35.) A critico-bibliographical study of the first tale of the *Arabian Nights*. The tale, the author thinks, was edited about the fifth century of the Hegira, if internal evidences are to be relied on.

—— Contes et légendes Arabes. (Ibid., 37–40.) Eight brief tales with references to literature.

Belck (W.) Ueber die Keil-Inschriften in der Tigris-Quellgrotte und über einige andere Ergebnisse der armenischen Expedition. (Verh. d. Berliner Ges. f. Anthrop., 1900, 443–448.) Explanatory notes on cuneiform inscriptions, with translations of some of them, in which the author differs in several points from Dr Lehmann.

Casanowicz (I. M.) *See* Adler (C.)

Carus (P.) The fairy-tale element in the Bible. (Monist, Chicago, 1901, XI, 405–447.) Treats of Babylonian cos

Carus—*Continued.* mogony, the Marduk myth, Yahveh and the Dragon, the two creation stories,—survivals in the Hebrew Bible of pristine paganism, the mingling in the Book of Genesis of two religions, paganism and monotheism.

de Cock (A.) De Arabische Nachtvertellingen. (Volkskunde, Gent, 1900–1901, XIII, 172–182.) First part of a critico-bibliographical discussion of general character, suggested by the publication of the Krebbers-Stamperius *Arabian Nights* for Dutch youth.

Duhousset (*Col.*) Les supplices en Perse. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1900, 5^e sér., I, 202–206.) General discussion, partly historical, of punishment in Persia. The extreme cruelty and savagery of punishment under the Persian kings and shahs are noted. Recently, however, some progress toward real civilization in these matters has been made.

d'Enjoy (P.) Le système des poids et mesures Annamites. (Ibid., 190–210.) After brief general introduction, author takes up in detail measures of length, itinerary measures, measures of surface, land-measures, measures of capacity, weights, and money. Explanations of the Annamite names are given. According to the author, the Annamite system (based on 10) is derived from Chinese, and traces of Occidental influences are clearly discernible. In certain parts of Annam and Cambodia Malay influences can be detected in the system of weights and measures. At present, too, French influence is making itself felt, for the five-franc piece or dollar of commerce has "filled a void," and is now incorporated into the Annamite system.

Gunkel (H.) The legends of Genesis. (Open Court, Chicago, 1901, XV, 261–283.) A general account of the poetical, etiological, ethnological, etymological, ceremonial, and geological legends in the book of Genesis, their significance, scope, etc.

Hartenberg (P.) Psychologie chinoise. (Rev. d. Psychol. Clin. et thérap., Paris, 1901, V, 97–102.) Résumé, with critical comments, of the article of Dr Matignon in the *Revue Scientifique*, 4^e sér., XV, 202–204.

Hopkins (W.) The ocean in Sanskrit epic poetry. (Amer. Journ. Philol., Baltimore, 1900, XXI, 378–386.) Discussion of "ocean words" in the Rāmāyana and the Mahābhārata.

Johansson (K. F.) Om de nyaste upptäckterna i Armenien. (Ymer, Stockholm, 1900, XX, 347–375.) A general account of the most recent discoveries in Armenia, especially those of Belck and Lehmann, 1891–99.

Karutz (R.) Ueber einen zusammengesetzten Bogen der Baschkiren. (Verh. d. Berliner Ges. f. Anthrop., 1900, 365–367.) Brief description, with figure, of a composite bow left behind in 1813–14 by a troop of Bashkirs in Lübeck, and now in the ethnographic museum of that city.

Kingsmill (T. W.) Gothic vestiges in central Asia. (Nature, London, 1901, LXIII, 608–609.) Author believes he has identified as Gothic certain tribes or peoples of central Asia mentioned in Chinese annals and by medieval geographers.

Laurent (É.) Les divers modes de sépulture dans l'Inde. (Rev. Scientif., Paris, 1901, 4^e série, XV, 403–404.) A brief account, from personal observation, of *nimtolla*, or burial by cremation at Calcutta, and of the Parsee "towers of silence" at Bombay.

Lehmann (C. F.) Ueber die Ergebnisse der von Dr W. Belck und Dr C. F. Lehmann 1898–1899 ausgeführten Forschungsreise in Armenien. (Verh. d. Berliner Ges. f. Anthrop., 1900, 430–438.) A résumé, with comments of some portions of the report of the expedition published in the Proceedings of the Royal Prussian Academy of Sciences. Transliterations of some of the texts with interpretations of proper names, etc., are given.

Patrick (Mary M.) The ethics of the Koran. (Internat. Journ. of Ethics, Phila., 1901, XI, 321–328.) The author notes the lack of imagination in the Koran, its decidedly democratic tendencies, and its freedom from the now common doctrine of fatalism. Its power (past and present) is attributed to "the simplicity of the categorical imperative, the justice displayed in the details of the law, and the despotic character of the religion."

Pitard (E.) A propos de la polyandrie chez les Thibetains. (Bull. de la Soc. Neuchâteloise de Géographie, 1900, XII, 302 ff.) According to the author Tibetan polyandry is due to a peculiar theory of the family, not to lack of women or a desire to restrict the population. Like everything else, the wife taken by the eldest brother (the proprietor *par excellence*) is the common property of the family, inheritably by his brothers in succession. Women are part of the household inventory and their position and treatment suffer correspondingly. Occasionally polygamy occurs. Not a few women in Tibet never marry at all, but enter the cloisters or become prostitutes. Legally, the children of the Tibetan family are the elder brother's.

Regnault (F.) Des statuettes en terre cuite provenant de Pondichéry. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1900, 5^e sér. I, 180–181.) Brief description of rude terra-cotta statuettes, representing men engaged in various occupations, a blacksmith and a potter especially.

de Rosny (L.) Le nirvâna. (Humanité Nouvelle, Paris, 1901, V, 103–119.) After protesting against the effort to tie religion up to etymology, the author argues that the interpretation of *nirvâna* as "nothing" is absolutely "incompatible with the ensemble of Buddhistic doctrine." The Tibetan, Mongol, Chinese, Siamese, Burman, Japanese translations of *nirvâna* are discussed, and the thesis indicated emphasized by their real signification Not only does *nirvâna* not mean "nothing" in the foreign Buddhistic lands, but there is evidence to prove, in the country where this religion had its birth, "nothing" is the later, non-original interpretation of the term.

Simpson (H. G.) The music of the Bible. (Method. Rev., N. Y., 1901, v ser., XVII, 359–373.) A brief general account of musical instruments, vocal music, musical education among the ancient Hebrews. The author thinks their music was borrowed from the Egyptians.

Virchow (H.) Das Knie japanischer Hocker. (Verh. d. Berliner Ges. f. Anthrop., 1900, 385–396.) Detailed anatomical account of the examination of the knees of two Japanese who "squat" (a woman of 29 and another of 60 years of age). The careful investigations of the author failed to reveal diagnostic evidences of "squatting" (*hocken*), or anything absolutely typical.

Walker (G. W.) Primitive industrial civilization of China. (Chautauquan, Meadville, Pa., 1901, XXIII, 126–132.) Very popular illustrated article.

Zaborowski (M.) Appareil phallique des cérémonies du mariage au Laos. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1900, 5^e sér., I, 242–243.) Brief note concerning a toy figurine made to imitate the act of cöition. These toys are common in Laos.

INDONESIA, AUSTRALASIA, POLYNESIA

v. Bülow (W.) Die Samoaner in der heidnischen Zeit. (Internat. Archiv. f. Ethnogr., Leiden, 1901, XIV, 23–26.) A critical review of recent missionary literature relating to early Samoan beliefs, customs, etc.

Haeckel (E.) Aus Insulinde. Malayische Reisebriefe. (Dtsche. Rundschau, Berlin, 1901, XXVII, 236–267.) Contains some notes on the Javanese of the Preang district.

Hiller (C. H.) The hill tribes of Borneo. (Harper's Monthly, N. Y., 1901, CII, 935–944.) Popular illustrated article relating to Ibans, Kyans, etc.

Kohlbrügge (J. H. F.) Anthropologische Beobachtungen aus dem Malayischen Archipel. (Verh. d. Berliner Ges. f. Anthrop, 1900, 396–401.) General notes of the physical characteristics of the Malays and "Indonesians" (as contrasted and compared with each other and with Europeans), based on the author's observations during seven years' residence in the East Indies. Dr Kohlbrügge thinks the Malays and Indonesians (or "primitive Malays") are closely related — the former are nearer the Chinese, the latter nearer the Polynesians. The maize-eating peoples of the archipelago have a body-weight nearer that of the European than have the rice-eating peoples. In stature these races of the archipelago do not exhibit noteworthy divergencies. Giants and dwarfs are alike rare, while the excessive infant mortality weeds out

Kohlbrügge—*Continued.*

the abnormals. Perhaps the most remarkable thing about these races, as compared with Europeans, is the greater elasticity of the bodily members, joints, muscles, etc.—an elasticity which, since it characterizes also whites whose childhood has been passed in the tropics, the author attributes to climate. "Tailed men" Dr Kohlbrügge sought in vain. Aside from malaria, residence in the Malay archipelago is not disadvantageous to the children of whites, but pure whites who perform manual labor are still too few to settle the question of colonization. *En passant* the author expresses the opinion that the "animal *Sage*" has had its origin in the "seelischen Ausdruck" of the eye of animals. This interesting paper concludes with some notes on the anthropoids of the region.

Schnee (*Dr*) Einiges über Sitten und Gebräuche der Eingebornen Neu-Guineas. (Ibid., 413–416.) Treats of birth, puberty, marriage, food, death, sorcery, etc. Bestial cöitus and *cöitus sub mamma ab latere* are reported, likewise an obscene dance. The feeling of modesty in the women is noted.

Sierich (O.) Samoanische Märchen. (Internat. Archiv. f. Ethnographie, Leiden, 1901, XIV, 15–23.) This section of Dr Sierich's memoir contains the Samoan text, with German translation and explanatory notes, of the tales of "The two Sisters," and the "Cannibal deceived." In the first the extensible heaven-tree appears, in the second the cannibal "wishes" obstacles to impede the fleeing youths.

AMERICA

Bell (R.) Legends of the Slavey Indians of the Mackenzie river. (Journ. Amer. Folk-Lore, Boston, 1901, XIV, 26–29.) English text of myths of "The Long Winter" and "The Guardian of the Copper Mine," from the Slave or Slavey Indians, an Athapascan tribe. The first is a variant of the "weather-kept-in-a-bag" myth,—here the bear is heat-keeper, and the rest of the animals circumvent her, and so put an end to the long, cold winter by letting loose the heat. But the flood occasioned by the rapidly melting snow would have depopulated the earth had not a great fish-like creature drunk it up. In the second legend a woman escaping from captivity among the Inuits discovers copper on her way home, leads her people to the place afterward, is insulted by some of them, sits down on the ground and in forty years time had sunk out of sight, burying the mine on which she sat.

Boyle (D.) Primitive art. (Archæol. Rep. Ont., Toronto, 1900 [1901], XII, 11–24.) Treats briefly of art in general, the human form in art (children's drawings), the human face in clay, stone pipes, pottery, bone. The author holds that "primitive man was only deficient—not absolutely defective in—originality." The difference between civilized and primitive peoples generally is that "among the former there is an enormously greater tendency to adopt, to adapt, to asssimilate, and to originate." Even in Peru and Mexico this progressive power was limited. In respect to the parallel between the child and the savage in art, Mr Boyle observes that "whether we say that the savage is but a child, or the child a mere savage, is quite immaterial." Another interesting fact noted is the greater success the Indian has had with the human face in clay,—with the human body he did not do so well. There is a good deal of truth in the author's remark "as with the child, the head is everything in primitive art, and, as with the child, there is no attempt at portraiture." These "notes" are illustrated by 31 figures, of which 13 are reproductions of drawings by children in Toronto kindergartens.

Carranza (J. de) Arte de la lengua Mexicana. (An. d. Mus. Nac., Mexico, 1901, Gramat., II, 93–108.) Continuation (the first part was published in the Anales for 1885) of the Mexican grammar of Fr. José de Carranza. Chapters IV–V of Book II deal with the plurals of reverential nouns, and Book III begins with the conjugation of the verb *tlatoa*, "to speak." Carranza's *Arte* is No. 612 in Pilling's *Proof Sheets*, and contains six books.

Chavero (A.) Manuscrito antiguo mexicano, inédito. (An. d. Mus. Nac., Mexico, 1901, VIII, 115–128.) The first part (chaps. I–V) of an unpublished Mexican manuscript from the collection of Señor Chavero. The

Chavero—*Continued.*

Spanish translation of the first three chapters is given in parallel columns, and a few footnotes are added. The translation and notes are the work of Padre Aquiles Gerste. The manuscript, which relates to the Toltec and Chichimec rule of Texcuco, is of considerable historical value, and contains many words not in Molina or Siméon.

Dorsey (G. A.) The Shoshonean game of nă-wá-tă-pi. (Journ. Amer. Folk-Lore, Boston, 1901, XIV, 24–25.) Describes, with 2 plates showing the balls used, a juggling game in use among the women of the Shoshoni of Wyoming. The balls are of clay or cut from gypsum. Among these Indians "contests of skill with these balls are occasions of considerable betting among the women, stakes of importance often being wagered." This ball-juggling game is found also among the Bannock, Ute, and Paiute, and probably other Shoshonean tribes, but "its presence among tribes of other stocks has not yet been noted." Dr Dorsey's observations were made in 1900.

Förstemann (E.) Drei Maya-Hieroglyphen (Ztschr. f. Ethnol., Berlin, 1900, XXXII, 215–221.) Discusses the occurrence and significance of the hieroglyphs for "lucky day," "unlucky day," and "fasting." The hieroglyph for "lucky day" the author connects with the sign for the day *oc* and with the dog (as the "good or lucky animal"), the hieroglyph for "unlucky day" with the day-sign *men*, and the eagle, a bird of evil or ill-omen.

Harris (W. R.) The flint workers: a forgotten people. (Archæol. Rep. Ont., Toronto, 1900 [1901], XII, 25–36.) A general and historical account of the Iroquoian "Neutrals" or Attiwandarons, whose territory, in the early years of the seventeenth century, "stretched from the Genesee river to the Detroit." These people had easy access to supplies of flint, controlling the chert beds in the region of Pt Abino on the Erie shore, whence their name of "Flint people," and their rôle of "Neutrals," since they furnished arms to both Huron and Iroquois proper; at least, this is the author's contention. The so-called "Southwold earthworks," near Port Stanley, "probably the best ruins of an Indian palisaded village to be found in western Canada," are attributed to these Indians.

Hough (W.) An early West Virginia pottery. (Rep. U. S. Nat. Mus., Washington, 1899 [1901], 511–521.) Describes, with 16 plates, specimens (now in the Museum) of the product of the old Thompson Pottery at Morgantown.

Hunter (A. F.) Bibliography of the archæology of Ontario. (Archæol. Rep. Ont., Toronto, 1900 [1901], XII, 50–62.) Some 105 titles of books, articles, newspaper items, etc, with résumés, comments, etc.

Koettlitz (R.) From Para to Manaos: a trip up the lower Amazon. (Scott. Geogr. Mag., Edinb., 1901, XVII, 11–30.) Contains brief notes on natives, rubber-manufacture, etc.

Kunert (A.) Riograndenser Paläolithen. (Verh. d. Berliner Ges. f. Anthrop., 1900, 348–352.) A general account of the "paleolithic" implement finds at the Morro do diabo on the Forromecco in the Rio Grande region of Brazil. The age of these paleoliths the author estimates as more than 2700 years.

Lamotte (A. V.) The Californian Indian. (Overland Monthly, San Francisco, 1901, XXXVII, 831–837.) A popular illustrated account of the Indians of California in the past. Houses, industries and arts, food, dances, legends, etc., are touched upon.

Mason (O. T.) A primitive frame for weaving narrow fabrics. (Rep. U. S. Nat. Mus., 1899 [1901], 485–510.) Discusses, with 9 plates and 19 figures in the text, the "heddle" frame among the Algonquian tribes, the Pueblo Indians, the Finns, the Germans, the Italians, the New Englanders (of Aryan descent), etc.,—a device used in weaving belts, garters, and similar fabrics. Professor Mason concludes that the heddle frame has its home in Europe or southwestern Asia, and that it was introduced among the Algonquian and Pueblo tribes since the Columbian discovery. This is a very interesting paper.

—— Pointed bark canoes of the Kutenai and the Amur. (Ibid., 523–537.) This brief paper (with 4 plates and 6 text illustrations) treats of the peculiar pine-bark canoe (pointed at both ends below

Mason—*Continued.* water) of the Lower Kootenay Indians, and its analogues among the neighboring Salishan tribes and the Giliak of the river Amur in Siberia and other tribes of that region. Incorporated in the paper are notes on the Kootenay canoe by Meriden S. Hill. To the references given should be added the account of the Kootenay canoe in the Report of the British Association for 1892.

Matthews (W.) Navaho night chant. (Journ. Amer. Folk-Lore, Boston, 1901, XIV, 12–19.) Describes (with 2 plates) in detail the longest and most important ceremony of the Night Chant of the Navaho Indians. Characters, dress, dances, etc., are treated of, and specimens of the songs given. An interesting point in these ceremonies is the action of the women and the so-called hermaphrodites, who sometimes take the place of small men and youths. The "clown," who relieves with buffoonery the long monotony of the night's performance, is a notable character. The male personators of female divinities sing in falsetto, and the women who act male parts do some in female costume. Although the words and syllables of the songs are mostly meaningless, "many of them are all-important and must not be changed or omitted."

—— The treatment of ailing gods. (Ibid., 20–23.) This brief rite-myth tells, in the words of a shaman, "how a couple of the greatest divinities [the war-gods Nayénĕzgąṇi and To‘badzıstsíni] of the Navaho pantheon were taken ill, and how they were successfully treated by a minor divinity [the fire-god, Hastsezıni]" for the war disease. The *motif* of the myth is the belief entertained by the Indians in the old day that "one who killed an enemy by striking in the chest would get disease in the chest; one who killed his enemy by striking on the head would get disease of the head; and one who killed by wounding in the abdomen would get disease of that part." Such was "war disease." The "cure" is given with some detail. The myth ends with the saying, "as was done to the gods then, so would we do today, if one among us got the war disease."

Parker (W. T.) The muskee-kee winni-nee. (Open Court. Chicago, 1901, XV, 289–300.) This illustrated article deals in general terms with "the 'medicine man' among the North American Indians,"—the author had the honor of "grand-medicine" conferred on him by the Ojibwa of White Earth reservation in 1879.

Price (Sadie F.) Kentucky folk-lore. (Journ. Amer. Folk-Lore, Boston, 1901, XIV, 30–38.) Enumerates many items of folk-lore from southern Kentucky—weather proverbs, folk-medicine, negro superstitions, love, luck, household "signs," agriculture, etc., are treated. According to the author the remedy of ridding a house of rats by "writing" to them "is so generally believed in one section of the state (and that, too, in quite an enlightened section), that it was the cause of a bitter neighborhood feud."

Prowe (H.) Altindianische Medicin der Quiché, Guatemala. (Verh. d. Berliner Ges. f. Anthrop., 1900, 352–354.) A résumé of the information in certain parts of the Popul Vuh (text of Brasseur de Bourbourg). According to Dr Prowe pages 72–74 form "a brief pathology." The Quiché of today seem not to know some of the names of diseases and of remedies mentioned in Brasseur de Bourbourg. The author credits the ancient Quiché with a knowledge of hypnotism and notes the fact that among these Indians today hysteria is very common.

Robelo (C. A.) Anahuac. (Bol. del. Inst. Cient. y Lit. "Porfirio Diaz," Toluca, 1901, IV, 2–7.) Discussion of the etymology of *Anahuac*, the Aztec name of the lake-region in the valley of Mexico. The author decides in favor of the derivation from *atl*, "water," and *nahuac*, "surrounded," the literal meaning of *Anahuac* being, therefore, "water round about," or "surrounded by water."

Rundall (W. H.) A curious musical instrument. (Musical Times, London, 1901, XLII, 310–312.) An illustrated account of the "piano Zapotecano," or *marimba* in use among the Indians of Guatemala. The author notes that the substitution by white experimenters of metal for wooden plates has not been a success so far as tone is concerned.

Sargent (D. A.) The height and weight of Cuban teachers. (Pop. Sci. Mo., N. Y., 1901, LVIII, 480–492.) Discusses, with tables and charts, the

Sargent—*Continued.*

height, weight, etc., of 973 Cuban school-teachers observed at the Harvard Summer School, 1900 (women 494, men 473). The ages of those examined were from 13 to 64 years. In physical development the Cubans compare unfavorably with American students. The women have some advantages over the men. Conditions of the Cuban environment and national customs count for something in explanation of the undeveloped physique of the Cubans.

Seip (Elisabeth C.) Witch-finding in western Maryland. (Journ. Amer. Folk-Lore, Boston, 1901, XIV, 39–44.) An interesting account of the surviving belief in witchcraft and its expression in Frederick county, etc. The population concerned are "descendants of Germans who settled in Frederick county about the middle of the last century" who are still "remarkably homogeneous."

Urbina (M.) Los Amates de Hernández ó higueras mexicanas. (An. d. Mus Nac., Mexico, 1901, VIII, 97–114.) The concluding portion of a discussion of the *amates* or trees and plants used by the ancient Mexicans in the manufacture of paper, etc., as recorded in Hernandez, with references to other authorities. In all 37 species are described,—figs, mulberry, *Desmodium, Cordia, Ehretia, Rivina, Epidendrum, Dendrobium*, etc. The native names are given, and, where known, their etymology.

Wintemberg (W. J.) Indian village sites in the counties of Oxford and Waterloo, Ontario. (Archæol. Rep. Ont., Toronto, 1900 [1901], XII, 37–40.) Brief account of village-sites belonging to the "Neutrals," or Attiwandarons, and of others ("invariably located near large streams or small lakes" — the "Neutral" sites being located near springs or small rivulets) attributed to a pre-"Neutral" people. The sites of these two sorts differ in various ways as to the nature and location of the remains found in connection with them. The author suggests that the much-discussed "bird amulets" may belong to the pre-"Neutral" people. A brief list is also given of shells found on these village sites, and the comparatively limited use made of them is noted.

NOTES AND NEWS

A Maine Indian Ceremony in 1605.—The principal portion of the following account of one of the earliest native dances witnessed by a white man on the North American coast has been well known for a long time. It was printed in Rosier's *Trve Relation* of Captain George Waymouth's voyage to Monhegan and the adjoining Maine coast, in 1605, and has been reprinted by the Massachusetts Historical Society, the Gorges Society, and at least twice separately. I am not aware, however, that attention has before been called to the very interesting additions to the description which appear in the version printed by Samuel Purchas in his *Pilgrimes* in 1625, volume IV, p. 1662.

Waymouth came to anchor under Monhegan on Whitsun-eve, May 18th, 1605, and on the following day sailed across to one of the islands nearer the shore, at the entrance to St George's river. There he made his headquarters for several weeks, exploring the river and the neighboring country. The ship was visited by numbers of the natives, probably coming from the settlement at Pemaquid, a few miles to the west. It was probably in the evening of June 1st that two of the Indians agreed to spend the night on board the ship, on condition that one of the white men should sleep with the other natives on shore. Owen Griffin, a young man who had agreed to remain in America when the ship returned to England, if it seemed advisable to maintain the claim to a place for a settlement by leaving some one there, consented to act as hostage with the Indians. Rosier's account of his experiences, as printed by Purchas, reads :

> Griffin which lay on Shoare, reported unto me their manner, and (as I may tearme them) the Ceremonies of their Idolatry, which they performe thus. One among them (the eldest of the company as he iudged) riseth right up, the rest sitting still, and sodainely cryed, *Bowh*, [*Baugh* in the 1605 version] *waugh ;* then the women fall downe, and lye upon the ground, and the men altogether answering the same, fall astamping round about with both feete as hard as they can, making the ground shake, with sundry loud outcries, and change of voyce and sound ; many take the fire stickes and thrust them into the earth, and then rest silent a while, of a sudden beginning as before, they looke round about, as though they expected the comming of something (as hee verily supposed) and continue stamping till the yonger sort fetch from the Shoare Stones, of which every man take one, and first beate upon them with the fire sticks, then with the Stones beate the ground

with all their strength: and in this sort (as he reported) they continue aboue two houres. In the time of their Pauose, [pow-wows?] o watch aboord [the ship] were singing, and they signed to him to d so, which he did, looking and lifting up his hands to heaven: the they pointed to the Moone, as if they imagined hee worshipped tha which when he with signes denied, they pointed to the Sunne risin which he likewise disliked, lifting up his hands againe, then they looke about, as though they would see what Starre it might bee, laughing o to another. After this ended, they which have wives take them apa and withdraw themselves severally into the wood all night.

George Parker Winship.

Skeleton in Armor.—In the last number of the *Anthropologist* noticed a reference to the "Skeleton in Armor." In this note it is in plied that soon after Longfellow visited the Fall River Museum an saw the skeleton, which was the subject of his poem, that museum w burned and all its contents were destroyed. This would lead one suppose that the so-called "armor" was destroyed in this fire, where while the skeleton was destroyed, the "armor," at least in part, ha already found its way to the Museum of Copenhagen where it had bee sent by Dr Jerome V. C. Smith.

This "armor" consisted of a piece of brass similar to the copp breast-ornaments which have often been found in Indian graves, and belt or breast-ornament made of tubes of brass which were strung so to be united side by side, as indicated by Mrs Julia Ward Howe in h letter published in this journal. Two of these brass tubes were give to the Peabody Museum by the late Dr Samuel Kneeland in 1887. reference to these tubes will be found on page 543 of volume III of t Peabody Museum *Reports*, with quite a full description, by Dr Kne land, of the specimens in the Copenhagen Museum, and a stateme that one of the tubes was analyzed and shown to be brass.

To an American archeologist the finding of brass tubes is eviden of an Indian burial since contact with the whites; whereas simil tubes made by hammering out pieces of native copper are common older Indian graves in many parts of the country. It will also be r called that arrowheads made of brass were found in the grave with t skeleton at Fall River. Similar brass arrowheads have been found other Indian burial places in Massachusetts and New York, to m personal knowledge.

Although we have not the Fall River skeleton for study, we can t inference feel confident that it was that of an Indian. I have sever times found whole brass kettles as well as ornaments made from piec of brass in Indian graves in Massachusetts and New York. Brass h the same archeological value as glass beads and pieces of looking-glass, pewter pots, and iron implements, and simply indicates that the burial was after white contact. F. W. PUTNAM.

Robert Grant Haliburton.—Robert Grant Haliburton, M.A., Q.C., D.C.L., was born at Windsor, Nova Scotia, June 3, 1831, and died at Pass Christian, Miss., March 14, 1901. He was the elder son of the Honorable Thomas Chandler Haliburton, the well-known jurist, writer, and member of Parliament, whose "Sam Slick" papers justly earned him the title of "father of American humor."

Following in the footsteps of his father, the son graduated from King's College, Windsor, with high honors. Within a year thereafter he was called to the provincial bar, where his exceptional ability soon became apparent. Removing to Ottawa shortly after, he established there an extensive practice. Amongst his most important legal successes were the settlement of the Prince Edward Island land disputes in 1860, and the determination of the legal status of fugitive slaves in Canada. Owing to the belief shared by father and son that the publication of one of the former's works had prejudiced a certain section of the electorate against both, Mr Haliburton declined to accept office under the Canadian government, but he was nevertheless able to make himself a factor of importance in politics as well as in the organization of various commercial associations.

A passage in Rivero and Tschudi's antiquities of Peru led Mr Haliburton to take up the study of the astronomical element in primitive myths and ceremonials. The result of his studies as revealed in his *New Material for the History of Mankind*—unfortunately a very rare work—proved the existence of a world-wide cult founded on the worship of the Pleiades as the stars of rain and the harvest. This cult was shown to have arisen from the use of the Pleiades as time markers, their position being such as to afford the simplest, and therefore the earliest discovered, means of defining seed time and harvest. Mr Haliburton's researches in this field have been extensively used by other well-known writers, such as F. Piazzi Smith in his *Life and Work at the Great Pyramid*, Blake in his *Astronomical Myths*, and Bunsen in his *Der Plejarden und der Thierkriess*, the last-named work being dedicated to him. He may reasonably be regarded as the pioneer of modern science in the field of symbolical astronomy.

In 1881, while at Tangier, he began the collection of notes on the folklore and mythology of Morocco. This led to the discovery of the existence of racial dwarfs in and near the Atlas mountains and won for the discoverer the medal of the Ninth Oriental Congress. In spite of this recognition, however, "Mr Haliburton's dwarfs" as they were termed, were regarded with incredulity by many, some writers assuming a tone which seemed to somewhat pass the bounds of legitimate criticism. But these critics were soon discomforted by the acceptance of the "little people" as true racial dwarfs by such authorities as Virchow and Sayce. This discovery induced Mr Haliburton to suspect the possible existence of dwarfs elsewhere, in spite of the prevailing ignorance on the subject. Traces of them were found in the Pyrenees and other parts of Europe, and more conclusive evidence in Central America, Peru, and the Amazon country. Various indications seemed to suggest that the dwarfs might once have been a widely distributed race, possibly synonymous with pre-glacial man ; but Mr Haliburton realized that the available evidence is not yet sufficient to establish such a theory, therefore he wisely abstained from presenting it. In 1897 he privately published at Toronto his various papers on the dwarfs in a volume entitled, *How a Race of Pygmies were Found in North Africa and Spain.*

Personally all those who have met him will remember him as a most genial and kindly man, who took an earnest and unselfish interest in all scientific research. Honest, fearless, yet cautious, with eyes wide open to see, tolerant of all views in the belief that even error, if honest, points the way to truth, and always courteous, even to those critics who passed the bounds of courtesy, it was not alone by his researches that science has profited, for his influence over others was as important as his work. To it we owe the Micmac studies of the late Dr S. T. Rand, besides several well-known works in the region where astronomy and anthropology meet. Nor was that influence confined to the scientific field. Perhaps the best known of Canadian poets, now deceased, declared that he and his companions had learned to look upon Mr Haliburton as a father who was ever ready with suggestion and encouragement. Such was the man whose loss all must deplore.

STANSBURY HAGAR.

An Algonquian Loan-word in Kiowa.—The Kiowa-English glossary accompanying Mr James Mooney's valuable study of the "Calendar History of the Kiowa," contains the following entry[1] :

"Taká-i-p'ódal—'Spoiled-saddle-blanket' ; a Kiowa signer of the treaty of 1867, where the name appears as 'Fish-e-more, or Stinking saddle' ; commonly abbreviated to *Taká-ite.* The name 'Fish-e-more,' as given in the treaty, is pronounced *Pí'semá'i* by the Kiowa, who say that it is a foreign word, old, and with no meaning in Kiowa." For this word an Algonquian (possibly through western American English) source suggests itself. It seems very probable that in *Fishemore-Pĭ'semă'i* we have a word which is thus recorded in Bartlett's "Dictionary of Americanisms" (4th ed., 1877, p. 15): "APISHAMORE (Chippewa, *apishamon.*) Anything to lie down on ; a bed. A saddle-blanket made of buffalo-calf skins, used on the great prairies." In Ojibwa and related Algonquian dialects *apishamon* signifies "anything to lie down upon, so as not to rest upon the bare earth, etc.," while the cognate words *apikweshimon* and *apishkamon* mean, respectively, "pillow, bolster," and "the piece of bark on which the paddler kneels in a canoe." Form and meaning offer no insuperable objection, nor does the location (present and past) of the Kiowa.

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[1] *Seventeenth Ann. Rep. Bur. Amer. Ethnol.*, Washington, p. 423.

ALEXANDER F. CHAMBERLAIN.

Eskimo and Samoan "Killers."—Murdoch says that before the introduction of steel traps at Point Barrow, Alaska, the following contrivance for catching the wolf was in vogue. It consisted of a stout rod of whalebone about a foot long and half an inch broad, with a sharp point at each end. It was folded in the form of the letter Z, wrapped in blubber, and frozen solid. It was then thrown in the snow, where the wolf could find and swallow it. The heat of the animal's body would thaw out the blubber, releasing the whalebone, which would straighten out and pierce the walls of the stomach, causing the animal's death. Schwatka says that in Hudson bay it was twisted into a coil like a watch spring. Specimens of these wolf-killers are in the National Museum from the Mackenzie river region. They are doubled up in zigzag shape and tied with a bit of sinew. The attention of the readers of the *Anthropologist* is called to this description in comparison with what follows from *Chambers' Journal*, May, 1901, p. 345 :

> In the Island of Samoa, sharks are captured in the following manner: From a piece of green bamboo about four feet in length, a strip is taken about an inch wide. After charring the points, the ends are sharpened carefully, and with great pressure the strips are coiled up into as small a compass as possible, the whole being kept in position by being sewed in the fresh skin of a fish. A dog is killed and the viscera removed. One of these coils is placed in the cavity and the dog is sewed up. When the shark appears, the dog is thrown overboard and swallowed by the shark. First the flesh is digested, then the skin of the fish with which the coil is held together. As soon as this takes place, the coil unwraps, the points stick into the stomach of the fish, which dies with lock-jaw, and its body is recovered.

O. T. MASON.

Ollivier Beauregard.—M. Ollivier Beauregard, who died at Paris, Jan. 14, 1901, at the age of 86 years, was the author of many articles of an anthropological nature. He was at one time President of the Anthropological Society of Paris, in whose *Bulletins* his name figures conspicuously. He wrote chiefly on Egyptian and Oriental topics, and in 1889 published a volume of ethnological and linguistic studies from the Orient. He was also a prominent member of the French Société des Traditions Populaires, and contributed to its *Revue* several papers on Malay folklore, etc. A. F. C.

THE FIFTH INTERNATIONAL CONGRESS OF CRIMINAL ANTHROPOLOGY will be held in Amsterdam, from September 9–14, 1901. The principal questions to be discussed are: First, anatomical and physiological characters of criminals, descriptive studies; second, criminal psychology and psychopathology, criminals and lunatics, theoretical considerations and practical measures; third, criminal anthropology in its legal and administrative application, principles to be followed, preventive measures, protective measures, penalties; fourth, criminal sociology, economic causes of crime, criminality and socialism; fifth, criminal anthropology and ethnology compared. Special questions, such as alcoholism, sexuality, juvenile criminality, senile criminality, hypnotism, criminal psychology in literature, etc., will also be considered.

IN THE SUMMER SCHOOL at Clark University, Worcester, Mass., to be held July 15–27, Dr A. F. Chamberlain, Acting Assistant Professor of Anthropology, will offer a course of twelve lectures on "Education among Primitive Peoples." The aim of this course will be to consider and interpret the educational phenomena with which the various races of men began their evolution toward the culture and civilization of today; to examine and discuss those modes of thought and action, which, being at the first, have made their influence felt through all the ages of human progress, and are still potent in matters of education. Dr Chamberlain will also offer an evening lecture on "The Poet and the Man of Science."

MR GERARD FOWKE has reprinted from the *Publications* of the Ohio Archeological and Historical Society his interesting account of the "Stone Graves of Brown County, Ohio." The author finds it impossible to assign a date to the remains or to determine the tribe which constructed them, although Dr Cyrus Thomas is inclined to attribute them to the Shawnee. Not more than half a dozen of the several hundred graves opened yielded specimens of any sort, a fact which leads to the author's belief that they are not of Shawnee origin. "So far as known," says Mr Fowke, "no stone graves as complicated and diverse in structure as these exist in other localities."

Dr Nicolas León, assistant naturalist and curator of the anthropological and ethnographical section of the Museo Nacional of Mexico, has issued a pamphlet in which is given a classification of the *Linguistic Families of Mexico*, being an "Essay of Classification; with a notice of the Zapaluta language and a confessional in the same" (Mexico, 1901, 13 pp., 8°). Dr León omits the Tequistatecana stock of Mason, and adds the Chinantecana, Chiapanecana, Maratiniana, Chichimecana, Tañoana, Shoshosheana, and Coahuiltecana, the last three being included in Powell's list as situated partly within the limits of the United States.

Roman Bread.—Hitherto ancient Roman bread has been known only from Pompeii. The excavations of Colonel von Grollen carried on during the last few years at Carnuntum, the ruins of which are some sixteen miles from Vienna, however, have resulted in the discovery of a bakery containing two ovens in which were found a number of carbonized but perfectly preserved loaves of bread. Carnuntum in Roman days was an important trading and garrison post. A. F. C.

Dr Arthur Hazelius died at Stockholm, May 27th, in his sixty-eighth year. Dr Hazelius was the founder of the Norwegian Ethnographical Museum, and of the unique and interesting Skansen, the open-air museum in the Zoölogical Garden of Stockholm, the result of nearly thirty years of labor, where the national life of old Sweden is represented in vivid fashion, not merely by means of buildings, but also by the festivals and music of earlier times.

An influential committee has been formed in Italy to celebrate the fortieth anniversary of Prof. Paul Mantegazza's entrance on his career as a teacher. This event was celebrated at Florence on April 30th, and at the same time the thirtieth anniversary of the Italian Society of Anthropology. It is proposed to collect a sum of money to be used for the endowment of the new laboratory of anthropometry which Professor Mantegazza has established at Florence.

The Society of German Naturalists and Physicians will hold its seventy-third annual reunion in Hamburg, September 22–28 next. Dr L. Prochownik and Dr K. Hagen, Superintendent of the Museum of Ethnography, will officiate as reception committee for the Section of Anthropology and Ethnology. It is requested that the titles of casual papers be sent in advance to the last-named gentleman.

PROF. DR BRETSCHNEIDER, formerly physician of the Russian leg tion in Peking, died in St Petersburg a short time since, aged 68 year He was counted among those best informed in regard to China, an published statistical works, mostly in the periodicals, on the geograph archeology, and botany of the empire. His *Botanicum Sinicum* is i dispensable for a knowledge of the ethno-botany of China.

O. A. ANUTSCHIN.—On March 30, 1900, the jubilee (25 years) of Anutschin as President of the Anthropological Section of the Royal S ciety of the Friends of the Natural Sciences, Anthropology, and Et nography, of the University of Moscow, was celebrated. At the sam time a new anthropological journal (published in Russian) w founded, with the title, *Russian Anthropological Journal.*

PROF. RUDOLF VIRCHOW of Berlin will pass his eightieth birthda on the 18th of October of this year. A committee consisting of man eminent men engaged in various fields of scientific research, has bee formed for the purpose of collecting a sum which will greatly increa the Rudolf Virchow Foundation and which is to be transmitted to t distinguished scholar on his birthday.

THE ROYAL INDIAN INSTITUTE (Instituut voor de Taal-, Land- e Volkenkunde van Nederlandsch Indiё) on the 4th of June celebrate in Hague the fiftieth anniversary of its foundation with a commemor tive address by Prof. H. Kern. The Queen took this opportunity create Herr J. H. de Groot, the treasurer of the Museum, a Knig of the Oranje-Nassau-Ordens.

ARABIAN BIBLIOGRAPHY.—There is in process of publication i Liège, Belgium, a "Bibliography of Arabian works, or works relating t the Arabs, printed in Christian Europe from 1810 to 1885," compile by Professor Victor Chervin, of the University of that city. It is work of prime importance for all students of comparative literatur folklorists, etc.

MR J. PIERPONT MORGAN has given to the Cooper Union Museu New York, a valuable collection of textile fabrics, illustrating t history of weaving through the Middle Ages to the end of the se enteenth century. The collection includes the Bodia collection Barcelona, the Rivas collection of Madrid, and the Baron collectio of Paris.

ANTHROPOLOGICAL PRIZES.—The Godard and Bertillon prizes the Anthropological Society of Paris will be awarded during the prese year. The Godard prize of 500 fr. will be given for the best memo on an anthropologic subject, and the Bertillon prize, of the same amount, for the best memoir on a subject relating to demography.

MAORIS OF NEW ZEALAND.—The recent census of New Zealand, if the preliminary returns are to be relied upon, reveals the fact that the Maoris, far from dying out, have actually increased since April, 1896, from 39,850 to 43,078, a gain of over eight per cent. Part of this increase may, however, be due to the great accuracy of enumeration.

DR FRANZ BOAS, of Columbia University and the American Museum of Natural History, has been appointed honorary philologist in the Bureau of American Ethnology, Washington. The appointment will in no way affect Dr Boas' duties in connection with the first two institutions, and he will continue to reside in New York City.

AT THE STATED MEETING of the National Academy of Sciences held at Washington, April 16–18, Dr T. Mitchell Prudden, Professor of Pathology in the College of Physicians and Surgeons, Columbia University, and Dr J. McKeen Cattell, Professor of Psychology in Columbia University, were elected to membership.

REV. J. CHALMERS, the missionary, met death on Aird river, Gulf of Papua, New Guinea, where, amidst many perils he was endeavoring to act as peacemaker between hostile tribes. His works on the natives of British New Guinea, published partly in conjunction with Dr W. Gill, are well known.

J. F. SNELLEMAN.—The new director of the Municipal Geographical and Ethnological Museum at Rotterdam is J. F. Snelleman (appointed February, 1901), who is remembered as having taken part in the exploring expedition sent into central Sumatra in 1879 by the Dutch Geographical Society.

DR WILLIAM Z. RIPLEY, of the Massachusetts Institute of Technology, has been invited to deliver the second Huxley Memorial Lecture before the Anthropological Institute of Great Britain and Ireland. The first of the Huxley Memorial Lectures was delivered last year by Lord Avebury.

THE TRUSTEES of the estate of the late Mary Hemenway, of Boston, founder and patroness of the Hemenway Expedition whose archeological researches in Arizona and New Mexico are so well known, have appropriated $500 for an anthropological fellowship in Columbia University.

DR WILLIAM HEIN, assistant custodian in the division of ethnology and anthropology in the Imperial Court Museum of Natural History, has been admitted as privatdocent for general ethnography in the University of Vienna.

GREEK-RUTHENIAN DICTIONARY.—The Greek-Ruthenian Dictionary to Homer, compiled by H. Ohonowski, has been taken over by the Ukrainian Ševčenko Scientific Society of Lemberg, Galicia, by whom it is to be published.

P. G. VON MÖLLENDORFF, who made himself favorably known by his numerous works on natural science, and on the ethnography and philology of China and Corea, died April 19th, at the age of 53.

DR F. W. VAN EEDEN, founder and director of the Colonial Museum in Haarlem, died May 5th, after a long illness, aged seventy-three years. D. M. Greshoff has been appointed as his successor.

MR ANDREW E. DOUGLASS has presented his collection of Indian archeological and anthropological specimens, numbering some 23,000 objects, to the American Museum of Natural History.

COLUMBIA UNIVERSITY has received an anonymous gift of $100,000 for the establishment of a department for the study of Chinese institutions, language, and history.

A MUSEUM OF ETHNOLOGY has been established at the University at Breslau through the efforts of Doctor Thilénius, Professor of Anthropology and Ethnology.

JOHANNES WEISMANN, for many years treasurer of the German Anthropological Society, died March 18th last at Munich, at the age of 76 years.

DR K. WEULE has been appointed assistant director in the Museum of Ethnology at Leipzig and professor of ethnography in the University of that city.

CORNELL COLLEGE, IOWA, has conferred the degree of LL.D. on Mr W J McGee, ethnologist-in-charge of the Bureau of American Ethnology.

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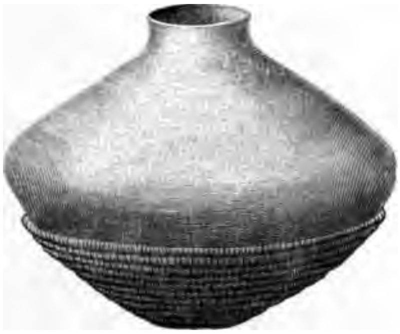
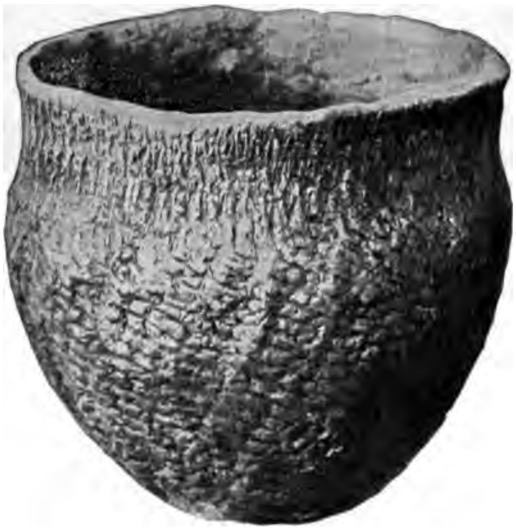


a. Use of a basket in molding the base of an earthen vessel. (Zuñi.)



b. Vase showing impressions resulting from the use of pliable fabrics in wrapping and sustaining the vessel while plastic.

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NEW SERIES

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USE OF TEXTILES IN POTTERY MAKING AND EMBELLISHMENT

BY WILLIAM H. HOLMES

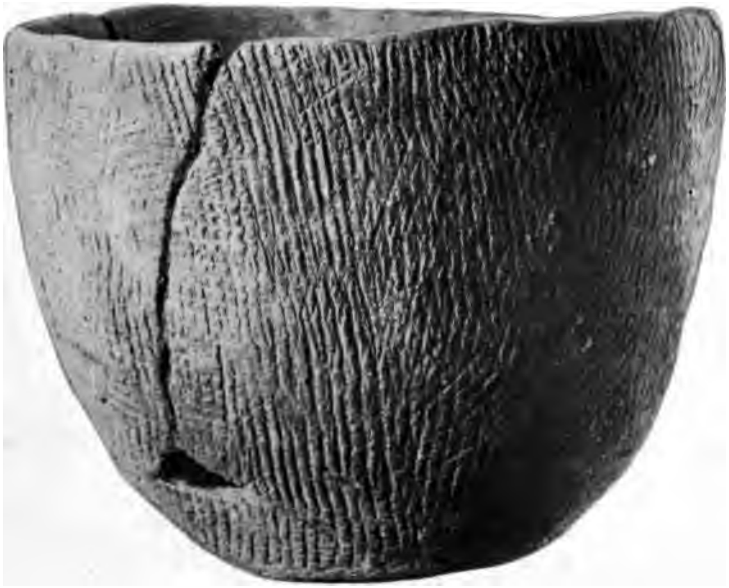
Among the native tribes of a wide zone in southern British America and in northern United States and extending from the Atlantic to the Rocky mountains, the ceramic art was intimately associated with the textile art and the earthenware exhibits traces of this intimacy as one of its most constant characteristics. These traces consist of impressions of textile articles made upon the plastic clay during manufacture and of markings in imitation of textile characters traced or stamped on the newly-made vessels. The textile art is no doubt the elder art in this region, as elsewhere, and the potter, working always with textile appliances and with textile models before her, has borrowed many elements of form and ornament from them. Textile forms and markings are thus a characteristic of the initial stages of the ceramic art.

It is true that we cannot say in any case whether the potter's art, as practised in the northern districts, is exclusively of local development, springing from suggestions offered by the practice of simple culinary arts, especially basketry, or whether it represents degenerate phases of southern art, radiating from faraway culture centers and reduced to the utmost simplicity by the unfriendly environment. We are certainly safe, however, in assuming that this peculiar phase of the art represents its initial stage—a stage through and from which the higher and more complex phases characterizing succeeding stages of barbarism and civilization arose.

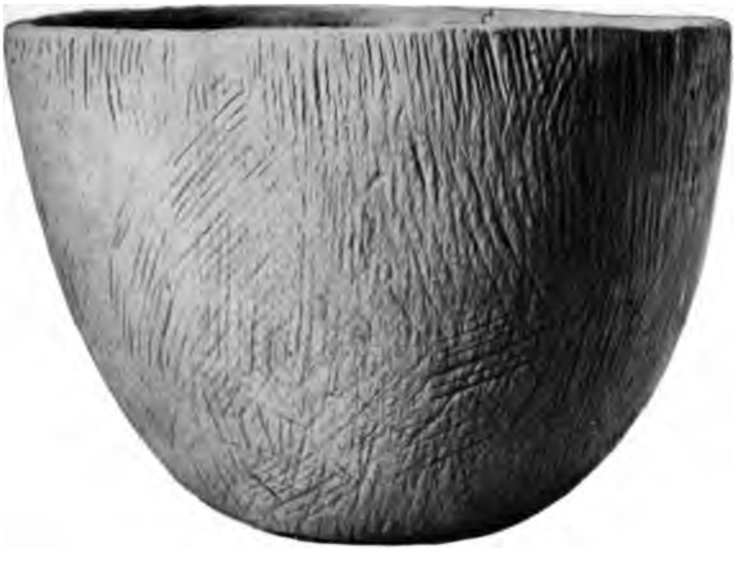
Whether the art passed through the textile stage with all peoples may remain a question, for the traces are obliterated by lapse of time. We observe in passing southward through the United States that the textile-marked wares become less and less prevalent, though enough is still found in Florida and other Gulf states to suggest a former practice there of the archaic art and a development from it.

Textile markings found on pottery are of five classes: First, impressions from the surface of rigid forms, such as baskets. Second, impressions of fabrics of a pliable nature, such as cloths and nets. Third, impressions from woven textures used over the hand or over some suitable modeling implement. Fourth, impressions of cords wrapped about modeling paddles or rocking tools. Fifth, impressions of bits of cords or other textile units, singly or in groups, applied for ornament only and so arranged as to give textile-like patterns. In addition, we have a large class of impressions and markings in which textile effects are mechanically imitated.

The several kinds of textile markings are not equally distributed over the country, but each seems, to a certain extent, to characterize the wares of a particular region or to belong to particular groups of ware, indicating, perhaps, the condition and practices of distinct peoples or variations in initial elements affecting the art. There may also be a certain order in the development of the various classes of impressions—a passing from simple to complex phenomena, from purely mechanical to conventionally modified phases of embellishment.



a. Bowl from a North Carolina mound, showing prints of cord-wrapped maleating tool.



b. Bowl made by the author. The surface was finished with a cord-wrapped paddle.

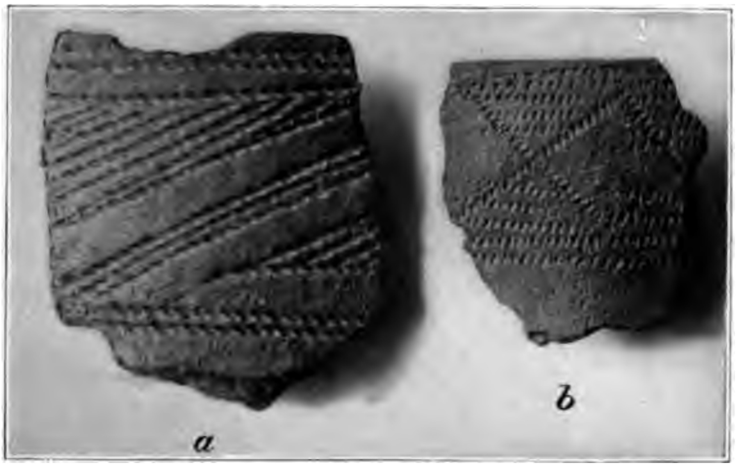
Baskets used in molding and modeling.—The extent to which baskets were used in modeling pottery in this great province has been greatly over-estimated. Instead of being the rule, as we have been led to believe, their use constitutes the exception, and the rare exception.

The functions of the fabrics and textile elements used in connection with the manufacture of pottery deserve careful consideration. There can be little doubt that these functions are both practical and esthetic, but we shall not be able to make the distinction in all cases. Practical uses may be several. In modeling a clay vessel a basket may be used as a support and pivot, thus serving as an incipient form of the wheel (plate VII, *a*). It may equally well assist in shaping the bodies of the vessels, thus assuming in a limited way the functions of a mold. The mat upon which a plastic vessel happens to rest leaves impressions rendered indelible by subsequent firing. The same may be true of any fabric brought into contact with the plastic surface, but the impressions in such cases are accidental and have no practical function.

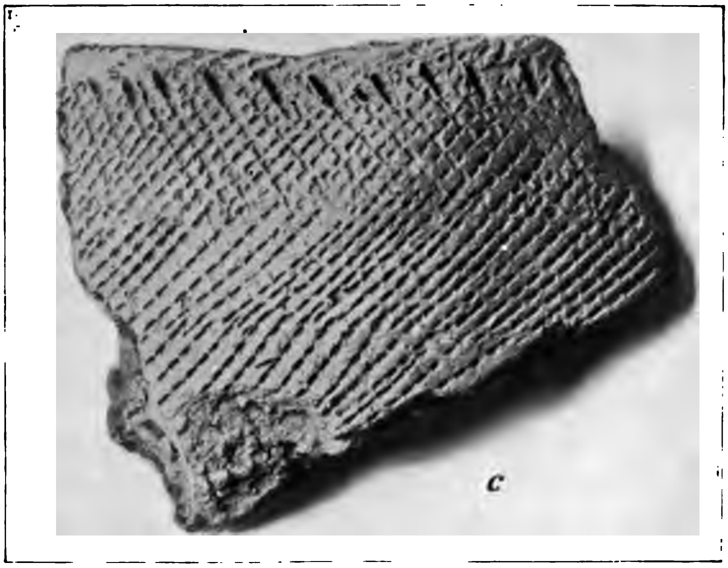
That baskets were used in the east as molds is attested by historical evidence. I can but regard it as remarkable, however, that in handling thousands of specimens of this pottery I have found no vase the imprints upon which fully warrant the statement that a basket was employed as a mold or even as a support for the incipient clay form. Many assertions to the contrary have been made, probably through misapprehension of the nature of the markings observed. On fragments of imperfectly-preserved vessels distinctions cannot readily be drawn between disconnected impressions made by the partial application of pliable fabrics or textile-covered stamps and the systematically connected imprintings made by the surface of a basket. The unwary are liable even to mistake the rude patterns made by impressing bits of cords in geometric arrangement about the rims of vases for the imprints of baskets.

Pliable fabrics as aids in modeling.—Pliable fabrics, such as sacks, nets, and cloths, were made use of as exterior supports in holding or handling the vessel while it was still in a plastic condition. Mr Mooney says that the Cherokee use a rag when lifting the pot at one stage of its manufacture, and it is easy to see that cloths or nets wrapped about the exterior surface of the plastic walls would serve to prevent quick drying and consequent cracking of the clay along weak lines. Binding up with cloths or nets would interfere with the deforming tendency of pressure during the modeling process and of sinking from weight of the plastic walls. Mr Sellers, a very acute observer, believed that the modeling of certain large salt basins was done on core-like molds of clay. In such a case, or where (as observed by Hunter) blocks of wood were used, the cloth would serve an important purpose in facilitating the removal of the plastic or partly dried clay shell and in supporting it during subsequent stages of the shaping and finishing processes. Such removal would probably be accomplished by turning the mold, with the vase upon it, upside down, and allowing the latter to fall off into the fabric by its own weight or by means of pressure from the hands. An excellent example of the impressions made on the surface of vases by fabrics applied in the course of manufacture is shown in plate VII, *b*. The specimen is a small vessel from a mound in Lenoir county, North Carolina.

Textiles used in maleating the surfaces of vessels.—An extended series of experiments made for the purpose of determining the functions of fabrics in pottery making has led me to observe that the imprintings were in many cases not made by textiles used as supports, but were applied wrapped about the hand or a modeling tool as a means of knitting or welding together the clay surface. Experiment shows that the deeper and more complex the imprintings, the more tenacious becomes the clay. Scarifying, combing, pinching with the finger-nails, maleating with engraved paddles, etc., served the same purpose.



Potsherds showing simple method of applying cords in vessel decoration.



Potsherd illustrating the markings of a notched wheel.

Use of flat cord-wrapped maleating tools.—It was further observed, as a result of these investigations, that more than half of the textile markings upon vases are not really imprints of fabrics at all, but are the result of going over the surface with modeling tools covered or wrapped with unwoven twisted cords. This is well illustrated in plate VIII, *a*, *b*.

Plate VIII, *a*, illustrates a small bowl from a mound in North Carolina. The surface is completely covered with deep, sharp markings made by paddling with a cord-wrapped tool applied repeatedly and at various angles. Fig. *b* of the plate shows a similar cup, made of potter's clay by the writer as an experiment. The maleating implement was a Cherokee potter's paddle wrapped with native cord.

Use of cord-wrapped rocking tools.—Of the same general class as the cord-wrapped paddle were other tools, more or less rounded and wrapped with cord. These may have been applied as paddles, but were usually rocked back and forth, the rounder forms being revolved as a roulette. The impressions of the flat paddle are distinguished by the patchy and disconnected nature of the imprints. The rolling or rocking implement was not lifted from the surface, and gave a zigzag connection to the markings.

The rolling or rocking modeling tools had an advantage over the flat paddles where round surfaces were to be treated, and especially about the constricted neck of the vessel. They served the triple purpose (1) of modeling the surface, reducing irregularities; (2) of kneading and knitting the surface, making the walls stronger; and (3) of imparting a texture to the surface that may have been regarded as pleasing to the eye. It is seen, however, that whenever it was desired to add ornamental designs, even of the most simple kind, this cord marking was generally smoothed down over the part of the surface to be treated, so that the figures imprinted or incised would have the advantage of an even ground.

Cords imprinted in ornamental patterns.—Growing out of the use of cord-wrapped tools in modeling and finishing the clay surfaces is a group of phenomena of great importance in the history of ceramic ornament. I refer to the imprinting of twisted cords, singly and in such relations and order as to produce ornamental effects or patterns. In its simplest use the cord was laid on and imprinted in a few lines around the shoulder or neck of the vessel. Elaborations of this use are imprintings producing a great variety of simple geometric patterns, differing with the regions and the peoples. Connected or current fretwork and curved figures were not readily executed in this method, and are never seen. Two examples of cord-imprinted patterns are shown in plate IX, *a*, *b*. Hard-twisted cords were in most general use, but their markings were imitated in various ways, as by imprinting strings of beads, and slender sticks or sinews wrapped with thread or other unwoven strands.

Imitation of textile characters variously produced.—It would seem that the textile idea went beyond the imprinting of textiles and cords and that textile markings were imitated in many ways, indicating possibly the association of ideas of a special traditional nature with the textile work and kept alive in ceramics by the imitation of textile characters.

Textile effects produced by the roulette.—The notched wheel or roulette was used in imitating cord-like patterns, and this was perhaps an outgrowth of the use of cord-covered maleating tools. This tool was confined pretty closely to one great group of ware—the so-called roulette-decorated wares of the northwest. The potsherd shown in plate IX, *c*, illustrates these markings as applied by the ancient potter.

Textile effects produced by stamps and engraved paddles.—Decorative effects closely resembling those produced by the use of cords and the rocking tool were made by narrow, notched stamps applied to the plastic surface. Connecting directly with this simple stamp work, in which a succession of separate imprintings give the textile effects, is the use of the engraved modeling-texturing-decorating paddle, so extensively used in the southern Appalachian region.

Owing to the close association of these rouletted, stamped, and incised effects with the textile imprinted groups of ware, I feel warranted in speaking of them as growing directly out of textile practices, although they are not necessarily always so connected, since the use of the stamp may also have arisen from other sources, such as the use of non-textile tools in modeling.

The textile art has thus served in various ways to shape and modify the ceramic art, and the textile technic has bequeathed its geometric characters to the younger art, giving rise to most varied forms of embellishment and no doubt profoundly affecting later phases of its development.

THE CATEGORIES

By J. W. POWELL

In my volume entitled *Truth and Error* I employed deductive reasoning to demonstrate the constancy of speed in the ultimate particle. The method will be justified in this article.

Induction leads to the discovery of laws. The laws themselves may at first be imperfectly understood and improperly stated; often they require revision from time to time as new facts are discovered. When at last the law is fully known and correctly stated it becomes a self-evident proposition. Every finally developed law is an axiom. Laws are objective facts inherent in objective nature; the discovery of these laws is an act of mind which reconstructs them from nature. So-called laws often prove to be fallacies of judgment, and laws as first stated often require restatement, for laws are creations of the mind only for the mind and not for nature. The mental operation is a struggle for natural truths, and the human statement of a law must ultimately conform to the natural law.

The nature of deductive and inductive reasoning will be set forth in a subsequent contribution; here we must be content with the bare statement just made.

A categorical question is one that can be answered by simple affirmation or negation with a "yes" or "no" or a nod of the head. That a categorical question may be asked it must be simply stated, and that it may be answered it must be understood and the facts known. A category is an ultimate fact simply stated, but in order that it be accepted it must be understood and the person who understands it must have the necessary knowledge.

A category is something ultimately simple. The term *simple* is antithetic both to compound and to complex. That is reduced which is changed from a compound state to a simple state, and from a complex state to a simple state, and that is irreducible which can be no further simplified. To understand how compounds are reduced to simples we have to understand how bodies are reduced to particles. Having reduced bodies to their ultimate particles, a further reduction is possible, not by analysis but by abstraction; this ultimate reduction ends in discovering the irreducibles.

Historically the effort to accomplish this end was first vaguely made by considering the nature of language, when the simples which language expresses were called categories or predicaments. This was Aristotle's work. He makes them ten in number, namely: substance, quantity, quality, relation, place, time, position, possession, action, and passivity.

Of this list of categories Mill says:

> The imperfections of this classification are too obvious to require, and its merits are not sufficient to reward, a minute examination. It is a mere catalogue of the distinctions rudely marked out by the language of familiar life, with little or no attempt to penetrate, by philosophic analysis, to the rationale even of those common distinctions. Such an analysis, however superficially conducted, would have shown the enumeration to be both redundant and defective. Some objects are omitted, and others repeated several times under different heads. It is like a division of animals into men, quadrupeds, horses, asses, and ponies. That, for instance, could not be a very comprehensive view of the nature of Relation which could exclude action, passivity, and local situation from that category. The same observation applies to the categories Quando (or position in time) and Ubi (or position in space); while the distinction between the latter and Situs is merely verbal. The incongruity of erecting into a *summum genus* the class which forms the tenth category is manifest. On the other hand, the enumeration takes no notice of anything besides substance and attributes. In what category are we to place sensations, or any other feelings, and states of mind; as hope, joy, fear; sound, smell, taste; pain, pleasure; thought, judgment, conception, and the like? Probably all these would have

been placed by the Aristotelian school in the categories of *actio* and *passio ;* and the relation of such of them as are active, to their objects, and of such of them as are passive, to their causes, would rightly be so placed ; but the things themselves, the feelings or states of mind wrongly. Feelings, or states of consciousness, are assuredly to be counted among realities, but they cannot be reckoned either among substances or attributes.

This is why I call Aristotle the founder of materialism. He vaguely thought mind to be nothing but Ποιεῖν and Πάσχειν—*actio* and *passio*—nothing but action and reaction. In the same manner Spencer considers mind to be nothing but energy, while many of our modern physiological psychologists take the same ground, that mind is the action and reaction of forces.

The subject of the categories was considered by Kant ; he makes them twelve, in four classes of three species, namely—

Singularity	Reality	Substance	Possibility
Plurality	Unreality	Dependence	Existence
Universality	Indefiniteness	Reaction	Necessity

This system has also been found defective. Kant believed the nature of mind to be insoluble,— to be the mysterious " noumenon," — while he classified the faculties into intellections, emotions, and will, and then divided intellection into sensibility, understanding, and reasoning. This method of treating the subject led him into immeasurable absurdities which found expression in the statement that the mind can only reach antinomies or contradictions. That metaphysic known in modern times as idealism, which was founded by Berkeley, now affirms that the whole universe is the construction of mind which has no objective reality. Mind is the only reality. By this system mind is the single category, just as energy is the single category with Spencer.

Science considers the objective world and discovers the simples of which it is composed. These simples, these categories, these predicaments, are the irreducibles. Thus we have the irreducibles considered as predicaments from the standpoint of language, as categories from the standpoint of psychology, and as simples from the standpoint of objective science. All of these words have the same significance.

Now I shall attempt to derive a new set of categories from the standpoint of science.

How Bodies are Resolved into Particles

First I must set forth how bodies are reduced to particles.

Simples are made compound by incorporation through organization, for that which is incorporated is organized, and that which is organized is incorporated. Incorporation and organization are views of the same thing from different standpoints. We look at the thing from the standpoint of incorporation when we consider it as one thing, and we look at it from the standpoint of organization when we consider the many things of which it is composed, but the many are one and the one is many. Incorporation and organization are therefore postulates one of the other.

Particles are organized into bodies and every particle of the organized universe is incorporated in a hierarchy of bodies. When many are organized into one we consider the one as a body, but we consider the many severally as particles. When we speak of bodies we call their production incorporation, but when we speak of particles we call their production into bodies organization. Bodies are incorporated of particles; particles are organized into bodies.

Ultimate particles are found in nature to be organized into five grand classes, as taught by modern science. There are molecular bodies, star bodies, rock bodies, plant bodies, and animal bodies. The unorganized particles constitute the ether, and the artificial organization of men into bodies politic constitutes demotic bodies.

In astronomy the universe is reduced to stellar systems, and stellar systems to individual stars. In rocks, plants, and animals a reduction into simpler elements can be made by dissection, or with the microscope, but the ultimate reduction of all bodies to molecular particles is accomplished by chemical analysis.

Molecules are also reduced to simpler elements sometimes called atoms. All the bodies of the earth can be reduced to about seventy such elements, and many of them are found to exist in the stars. By chemical and physical research laws are found which lead chemists and physicists to believe that the so-called elements or atoms are themselves compound bodies. At the present time knowledge is limited in the direction of the minute as it is in the direction of the vast.

The ultimate simplicity of the particle stands upon the same experimental and logical foundation as does the ultimate system of the stellar universe.

The ultimate simplicity of atoms as particles has not been inductively established; but the multitudinous and diverse bodies of the world have been reduced to a very small number, and relations have been discovered that can be explained only upon the hypothesis of their reduction to unity by further analysis, just as astronomical research has not yet inductively discovered a completely unified system of stars. The unification of the stellar system and the unification of the molecular system stand upon the same inductive basis. The work has progressed in the direction of unification almost to the verge of the infinitesimal and the infinite, as these terms are used by science, and the facts already discovered in this borderland of research can be explained only by assuming ultimate unification — one kind of ultimate simple particle, one ultimate system of stars; thus both of these propositions have been deductively established.

I have stated in a brief manner how the bodies of the universe are reduced to particles by telescopic and microscopic resolution and by chemical analysis, and the progress which has been made in this work by resolving them inductively and experimentally into a very few, and that we have reason to believe they are compounded of one kind of ultimate particles, all organized into one ultimate stellar system. This is what I understand to be the monism of science.

The method of resolving bodies into particles I call *analysis*, and the proof of analysis is synthesis. I use the term analysis with a specific meaning, to distinguish it from abstraction. The proof of abstraction is concretizing.

How Concrete Objects are Resolved into Abstract Objects

Here I must first demonstrate that the abstract is always more simple than the concrete.

An object stands upon the table. I do not know what it is, and I first look at it and see its color in chiaroscuro, but I have learned how to interpret this color as a representative of form; this is the doctrine taught by modern psychology. I strike the object with my pencil, and discover the sound which it makes; I also interpret this sound as a mark of another element of its form, and I find that the object is hollow. I lift the object and find it is not heavy, and I further interpret this sensation and conclude that it is painted wood. I touch it and learn that it has a lacquered surface, and then smell it in examining the vapor which it exhales. Now I am ready to affirm that the object is a painted wooden bottle which has contained some odorous substance.

In this manner the concrete object is cognized by making a combination of its abstract attributes. Thus the humblest worm obtains all its knowledge of the objective world by combining abstractions. Every animal with the best developed organs of sense cognizes by abstracts, and then combines these abstracts to cognize concretes. Concretes are cognized by concreting abstracts. This is a universal law.

An ultimate particle can be resolved still further by abstraction. It is found that certain things are essential to it; that it cannot exist without these essentials, and that if one should be taken away the particle itself would be annihilated.

The ultimate particle must be an abstract unity. If the one could be resolved into many it would not be ultimate. If the one were annihilated the particle would be annihilated. Ultimate unity is essential to the existence of the ultimate particle.

The ultimate particle must be extended. If the extension were transmuted into unity, the particle would be annihilated; if unity were transmuted into extension, the particle would be annihilated. The unity and extension belong to the same particle. A unit without an extension is nothing; an extension without a unity is nothing; it must be one and extended.

The ultimate particle must have speed. Every particle of the universe known to man has motion. Every particle organized into a body must have the motion of that body, and every particle of organized matter exists in a hierarchy of bodies. The particle in the rock has its motion as heat, its motion in rotation on the earth's axis, its motion in revolution about the sun, and its motion in all the other bodies of the hierarchy. All bodies have motion and all particles of the ether have motion, but this motion is speed and path. The ultimate particle must have speed; we will consider its path hereafter. It is manifest that the speed of the particle cannot exist without the extension, and that the extension cannot exist without the speed anywhere in this universe. Speed is not extension, and extension is not speed. Speed cannot be transmuted into extension; extension cannot be transmuted into speed, but speed is essential to the particle.

Every particle must have persistence or continued existence, else the particle would be annihilated. The particle cannot come from nothing or go into nothing. The persistence cannot be transmuted into speed, nor can the speed be transmuted into persistence.

The particle must have not only unity, extension, and speed, but it must have persistence; persistence is therefore essential to the particle.

Every particle must have affinity if it exists in a body, for the particles of every natural body are held together by affinity, and no body of particles without affinity has yet been discovered. Affinity implies choice of association, and choice of association implies proto-consciousness, therefore every particle must have proto-consciousness as one of its essentials. Consciousness is not persistence, consciousness is not speed, consciousness is not extension, consciousness is not unity; but the particle has unity, extension, speed, persistence, and the proto-consciousness of affinity.

I have affirmed that every particle must have five essentials, but it must not be understood that they are possessions with which it can part. The particle is a unit, an extension, a speed, a persistence, and a proto-consciousness. Here is a squirrel playing under the tree by my window. It has a head, body, legs, and tail. It cannot part with its head, body, legs, and tail and still remain a squirrel. It cannot part with its metabolic organs, nor with its circulatory organs, nor with its muscular organs, nor with its reproductive organs, nor with its neural organs and still remain a squirrel; and if dissected it is but fragments of a squirrel undergoing dissolution because its organization is destroyed. But these are concrete parts of a squirrel that still remain as particles of matter after the squirrel has been disorganized, while the particle has abstract essentials to its existence with which it cannot part without annihilation. The ultimate particle does not depend on organization, but its essentials are inherent.

Every particle consists of five essentials. They are concomitant and cannot exist apart from one another. They are, as essentials, totally unlike one another and must therefore always be clearly distinguished. One essential cannot be derived from another. Unity cannot become extension, extension cannot become speed, speed cannot become persistence, persistence cannot become proto-consciousness; but one particle must be a unit, an extension, a speed, a persistence, and a proto-consciousness. As one body may be composed of many particles, so one particle is composed of many abstract essentials. The one is many and the many are one—many abstract essentials in one concrete particle.

Thus bodies are resolved into particles to get concrete simples, but the particles themselves may be further resolved into abstractions which I have here called essentials.

The ultimate particle in its essentials is absolute in that it does not depend on other particles for these essentials, but they inhere in itself without the aid of others. I shall therefore call these abstract essentials *absolutes*, and I shall define the term thus: An absolute is something which is independent of other things for its existence. It exists in itself. I use the term *thing* as the universal noun for all abstract or concrete objects, and I use the term *entity* for all concrete things only.

The pentalogic absolutes are concomitant in every particle; they cannot be taken from it, nor can a new absolute be added to it.

Thus I have demonstrated one pentalogic group of abstract simples as the absolutes of an ultimate particle of matter.

Relations

A relation must exist between two or more terms. The terms may be ultimate particles; but if one ultimate particle is related to another, then the five absolutes in one must be related to those of the other severally. The unity must be related to the unity, the extension to the extension, the speed to the speed, the persistence to the persistence, and the proto-consciousness to the proto-consciousness. A relation is a condition between two or more terms in respect to some connection between them.

Plurality.—One does not depend upon another for its unity, but the *one* may be an element in a plurality of *three.* The relation is that of likeness. It is taught in primary arithmetic that you cannot add unlike things. The three constitute a plurality. A plurality is thus a number of units related to one another in respect to some likeness.

There are many ultimate particles; neglecting the ether, all others are organized into bodies. There are many bodies, each constituting a unity of a plurality. Thus we have natural units of different orders, the plurality itself being an incorporated unit. The body is organized of a plurality incorporated in a unity. Unity is the absolute on which plurality is founded. Plurality is therefore the relative of unity.

Position. — Extension as an absolute has position for its relative. Position is the relation existing between two or more particles in respect to their mutual directions from one another and their mutual distances from one another. There is thus a double or polar direction from one particle to another, one being the opposite of the other, but the distance is the same. Considering the simplest relation of position as that which may exist between two particles, position is their mutual relation in respect to direction and distance.

Path. — Speed as an absolute in the ultimate particle has path as its relative, for the path is dependent upon others. It is taught in physics that any particle or body will have its motion directed in a straight line from which it will not deviate, nor will it increase or diminish its velocity unless it is interfered with by another particle or body. Two ultimate particles may interfere with each other by collision, when the path of both will be changed. In the case of the collision of bodies they will be mutually deflected, even to the extent of reversing the direction of molar motion, but neither one will increase nor diminish its speed, but all of the particles of both bodies will be deflected. Path, therefore, is the direction taken by an ultimate particle as determined by its collisions.

Change. — The persistence of an ultimate particle as an absolute has change as its relative, for it is dependent upon others. Change is a relation between terms. In this case the terms are persistence and the relations are changes. The relation of a change is a relation in respect to sequence, and the relation of sequence in ultimate particles is the relation of cause and effect, but in the simplest case there are two causes and two effects. Let us call cause and effect *causation*; then causations are mutual in relations of causative sequence. Therefore change is a relation with respect to causation.

Choice. — Consciousness in the ultimate particle as an absolute has choice as a relative, for choice is the choice of others. Consciousness is awareness of self. Choice of one another in ultimate particles is affinity which implies proto-consciousness. The choice is always made for a purpose; therefore choice is the relation of selection for a purpose.

Remark: The will of all animal life can be resolved into the choice of ultimate particles.

Thus I have demonstrated a second pentalogic group of simples or categories.

The relations when reduced by abstraction to ultimate simplicity are found to be plurality, position, path, change, and choice. For every relative there is a corresponding absolute upon which it is founded. Unity is the foundation of plurality, extension is the foundation of position, speed is the foundation of path, persistence is the foundation of change, and consciousness is the foundation of choice.

Absolutes are Constant and Relations are Variable

The ultimate particles of the universe are constant, hence the essentials of these particles are constant; but these essentials are absolutes, hence all absolutes are constant.

The one of an ultimate particle remains one forever; it is constant. The ultimate units of the universe constitute a totality. This totality is broken up into many variable pluralities. Thus we have molecules of different orders, which are bodies of different orders, and some may be dissolved while others may be formed. Not only molecules but all other bodies may be constituted and destroyed, reconstituted and redestroyed to an infinite degree. Thus pluralities are variable.

The extension of every particle is the same and constant, but the position of every particle is variable, for severally they are in motion and the direction of these motions and their distances apart are forever changing; thus the position of every particle to others is variable.

The speed of every particle is the same and constant, but the path of every particle is variable from a straight line, for its path has components in every body in which the particle exists. The path of every particle is variable from a straight line, being in fact a vortex path.

Remark: That which we call acceleration of molar motion is wholly deflection of particles and is not acceleration of speed.

Notwithstanding the acceleration of molar motion appears to the eye as acceleration of molar speed, this is not true of the ultimate particles. The seen speed of a molar body may be made to begin, increase, diminish, and end by deflecting the unseen speed of its particles. A molar body lying upon the table may seem to be at rest, yet we know that it is in motion with the earth and with the solar system; in like manner we know that it has molecular motion, and these motions must all be deflected if it is given molar motion. If we call the motion of a particle of matter in its hierarchy of incorporations vortex motion, as it was called by Descartes, then molar motion may be given to a body by deflecting its vortex motion. Though I have elsewhere demonstrated that the speed of the particle is constant, I here show that it is a self-evident proposition. The persistence of every particle is the same and constant, while change is variable. This statement is self-evident.

Consciousness is constant, but choice is variable. This proposition has already been demonstrated.

Quantities

We have found that absolutes are constant and that relations are variable. On these absolutes and relations quantities are founded; every particle, whether ultimate or compound, has quantity. The quantities are number, which is unity and plurality; space, which is extension and position; motion, which is speed and path; time, which is persistence and change; and inference which is consciousness and choice, the inference being that a purpose will be subserved.

The space with which science deals must here be distinguished from the space of metaphysic. Science deals with a space composed of parts of extension, metaphysic deals with a space of void. The savage does not know of the existence of the atmosphere; he considers the floor of the earth to be domed with a firmament so as to constitute the tabernacle of the world—an unoccupied region, a void, a theater for animals and ghosts. We still retain the vestiges of this primeval doctrine when we consider space as void. Science does not proceed on the theory of void space, but of unconsidered space. Descartes banished such space from science.

Abstraction is a method of consideration. Metaphysic has a way of expressing the act of abstraction which yields an absurdity. Instead of saying that an attribute is selected for consideration, it says in effect that absolutes are taken from a concrete object until only the object remains to be considered; the object is then a nothing — a void.

Certain attributes of an object can be changed; thus the body that is cold may be made warm. But when the attributes of a body are resolved into categorical elements, one cannot be taken away without annihilating the object, nor can all attributes of a body be abstracted and leave anything to be considered.

Remark: Inferences of void space have never been verified, and thus become cognitions; but as these inferences are habitual and hereditary, the concept is not easily obliterated from the mind. The origin of the concept seems to come from savagery when the sky was considered as a firmament and the earth as the floor which inclosed a void space. This we now know is a pseudo-concept, yet it was confirmed by another when void minute spaces were conceived to exist. By the Greeks the ultimate particle was conceived to be round and rigid or hard, and the universe made up of round, hard particles would have interspaces. Now we must conceive that the ultimate particles are neither spherical nor rigid, but that they have extension, which may be deformed. Thus they may exist together in some other method of extension which may be deformed. Thus space is continuous without void. Yet there is another pseudo-concept which seems to mitigate against this doctrine when motion is considered as existing in void space. When space is considered as continuous, then motion must be considered as existing in continuous space. To clearly conceive this we must give an illustration:

A hollow cylinder may be conceived as being filled with smaller cylinders which touch one another without intervening voids; thus one cannot move without all moving. In the same manner we must conceive that the ultimate particles touch each other without intervening voids, but in order that one may move all must move with like and constant speed. One particle therefore cannot move unless all move. This conception harmonizes with the space of scientific teaching and also with the motion of scientific teaching.

Number is totally unlike space, space is totally unlike motion, motion is totally unlike time, and time is totally unlike inference. Every one is totally unlike every other one. Space cannot be transmuted into number, motion cannot be transmuted into space, time cannot be transmuted into motion, and inference cannot be transmuted into time. No one of these quantities can be transmuted into any other one; that is, they are wholly unlike one another and wholly underived one from another.

Thus we have demonstrated a third pentalogic group of simples or categories.

Properties

Particles constitute bodies, and we may consider them severally as particles or conjointly as bodies. From the standpoint of particles, quantities are involved; from the standpoint of bodies, properties are involved. Properties are founded on quantities, quantities are founded on relations, and relations are founded on absolutes.

Passing from the consideration of these particles to the consideration of bodies, number is considered as class, space is considered as form, motion is considered as force, time is considered as causation, and inference is considered as conception. This may be stated in another way: In the process of organizing particles into bodies, number becomes class, space becomes form, motion becomes force, time becomes causation, and inference becomes conception. Thus there is an objective reality corresponding to the subjective reality. The quantities still remain as quantities if we consider the particles, but the properties appear if we consider the bodies. For example, here are ten hollow cylinders or pipes, but they are organized into a gas stove. If we consider the pipes they are of cylindrical form, but the stove is not cylindrical. There are many attributes of the pipes which are not the same as the stove. Water is composed of oxygen and hydrogen, but there are attributes of water which are not found in oxygen and hydrogen severally. Vessels will float on water, but not on oxygen or hydrogen gas.

Number and class are reciprocal; space and form are reciprocal; motion and energy are reciprocal; time and causation are reciprocal, and, finally, inference and conception are reciprocal; that is, number in the particles becomes class in the organized body; motion in the particles becomes energy in the organized body;

time in the particles becomes causation in the organized body, and inference in the particles becomes conception in the organized body.

As absolutes are wholly unlike one another and cannot be derived one from another, and as relations are wholly unlike one another and cannot be derived one from another, and as quantities are wholly unlike one another and cannot be derived one from another, so properties are wholly unlike one another and cannot be derived one from another.

Thus we have demonstrated a fourth group of simples or categories.

Qualities

Particles and bodies inspire purposes when they are considered as good or evil. This gives rise to qualities. A quality is the good or evil of a property, quantity, or relation of a particle or body for a purpose had in view. Qualities are founded upon absolutes, relations, quantities, and properties, for these are necessary to qualities.

Qualities are grouped by purposes, and these are five-fold, viz., pleasure, welfare, morality, expression, and opinion.

All qualities are good or evil, and are thus antithetic or positive and negative. Thus pain is antithetic to pleasure, illfare is antithetic to welfare, morality is antithetic to immorality, expression has its antitheses in truth and error, while opinion has its antitheses in wisdom and folly.

These purposes give rise to five arts; they are esthetics, industries, institutions, languages, and instructions.

Pleasure, welfare, morality, truth, and wisdom are totally unlike one another, and they are totally underived one from another, yet they are concomitant in every effect on men and in every human act. There can be no pleasure or pain that is not also welfare or illfare. There can be no welfare or illfare that is not also moral or immoral. There can be no morality or immorality that is not also expressed as truth or error, and there can be no expression that is not also opinion as wisdom or folly.

Although these categories are disparate, yet they are interdependent. There is pleasure in welfare, pleasure in morality, pleasure in expression, and pleasure in opinion. There is welfare in pleasure, welfare in morality, welfare in expression, and welfare in opinion. There is morality in pleasure, morality in welfare, morality in expression, and morality in opinion. There is expression of pleasure, expression of welfare, expression of morality, and expression of opinion ; and finally there is opinion about pleasure, about welfare, about morality, and about expression. They are thus doubly concomitant.

Thus we have demonstrated a fifth group of simples or categories.

The categories which we have thus demonstrated are grouped as absolutes, relations, quantities, properties, and qualities. These rubrics we call *secondary categories*, and the categories into which they are resolved, *primary categories;* that is, there are five groups of secondary categories, every one composed of five primary categories.

Secondary categories constitute an ascending series. There can be no relations without absolutes; no quantities without relations and absolutes; no properties without quantities, relations, and absolutes; and no qualities without properties, quantities, relations, and absolutes. The series is ascended, for the upper is constituted of all the lower.

It will be found useful and important that we should give names to each group of the primary categories. Unity, plurality, number, class, and pleasure we shall call the unit categories. Extension, position, space, form, and welfare we shall call the extension categories. Speed, path, motion, force, and justice we shall call the speed categories. Persistence, change, time, causation, and expression we shall call the persistence categories. Consciousness, choice, inference, conception, and opinion we shall call the consciousness categories. Thus we have unit categories, extension categories, speed categories, persistence categories, and consciousness categories.

These categories are all unlike one another, and hence they are not classes. A class is founded upon likeness, and degrees of likeness make different classes, while categories are founded on unlikeness. Categories are abstractions ; classes are concrete things or entities. These are fundamental distinctions between class and category.

Classification is not abstraction. Berkeley was the first to set forth this doctrine, if my reading serves me well. The concept of a horse is not an abstraction, and the concept of any horse or all horses is not an abstraction. The concept of a class includes all of the class. The concept of vertebrates includes all of the vertebrates with all of their attributes. Every individual vertebrate animal has more attributes or marks than those which are common to all vertebrates, for it has its own peculiar marks which distinguish it from all other members of the class. This is true of every individual vertebrate, and the sum of the individuals which constitute the class have the sum of the characters which the individuals possess. Mammals, birds, reptiles, batrachians, and fishes are all vertebrates, but every such class has characters peculiar to itself which distinguish it from other groups. Yet one bird has all the characters which make it a bird and all the characters which make it an individual, and the class of birds have all the characters of the individual members of the class, and there does not exist any concrete being having only the attributes common to all birds.

The rule of formal logic that the intension of a class term is inversely proportional to its extension is invalid, because it is a pseudo abstraction. The mental act of generalization is totally distinct from the mental act of abstraction. What is valid is this: When we consider a kind in one of a series and discover an attribute in it, we expect to find that attribute in every other member of the series; or, knowing the attribute in one of th series, we seek to find it in the others, and only those attribute common to the series are considered as marks of the class.

Laws are applicable to classes of bodies inversely proportion to the extent of the class.

A bad habit of speech may result in a fallacy of thought. I the evolution of language this phenomenon is often foun Max Müller, in one of its manifestations, has called it a disease language. Metaphysic has inherited this disease. The ancien thought categories to be distinct entities; that is, they reifie categories, and it was very natural for them to speak of matter an energy as if they were separate existences; it was also natur for them to speak of mind and body as if they were separate e istences, for they firmly believed in the ghost notion. This habi of speaking of mind and body, or of force and body, or of min and force and body, or of matter and mind and force, was legi imate to the primitive mind. Of course we may still continu to speak of matter and mind, of matter and cause, of matter an force, of matter and form, or of matter and class; but he wh really understands the nature of the categories in their concon itance will understand it as a faulty method of expression. is a false method of expression to speak of a particle or body an one of its categories as if they were distinct entities.

Abstraction is not symbolism, with which it is sometimes co founded. A verbal symbol is a representative of a concept, whil a concept is a subjective representative or symbol of an obje tive phenomenon, but the act of abstraction is totally differen Abstractions may be symbolized and concretes may be symbo ized; particulars may be symbolized and generals may be sym bolized; but we must properly distinguish between abstractio symbolism, and generalization.

The Development of Attributes

Let us next consider the development of attributes by o ganization.

Attributes are evolved when particles become bodies. Thus particles of chlorine and particles of sodium become common salt, and salt has attributes additional to that of chlorine and sodium. The particles of common soda are sodium and carbon. Sodium is a white metal, and carbon is a gray graphite which, when crystallized, is the diamond. Thus the particles have their own attributes while the bodies have additional attributes.

The law may be stated thus: Particles in becoming bodies have additional attributes.

Now I wish to show how the abstracts which we call categories are developed when particles are organized into bodies.

Units.—Number is unity and plurality. When ultimate particles are organized into bodies, number becomes class, for a new class is constituted, while the unity becomes a kind and the plurality becomes a series of this kind. Or otherwise stated, the particles in number are all alike; hence they have no class, for a class involves likeness and difference, but a body is a class like other such bodies but different from its particles. Class begins with the incorporation of bodies from ultimate particles. When one class is organized with another, as molecules with molecules, by affinity, then class is organized with class and a third class is produced with additional attributes, and this process may continue to the limit of the organization of classes, and with every class formed new attributes will appear. Thus attributes of class are greatly multiplied. We may formulate this law:

I. As kinds are multiplied by organization, attributes are correspondingly multiplied.

Extension.—Let us again consider particles and bodies in respect to the organization of extension, which is the second absolute category. Space is extension and position. By organization space becomes form, because the extensions of the particles become the figure of the body while the positions of the particles become the structure of the body. Otherwise stated: The particles in space have no figure but their own, but the particles in the body have a new figure. The particles in space have no structure but their own, but the particles in the body have a new structure.

When forms have been produced they may be organized with other forms by gravity in an ascending series of compound forms, and with every such organization additional attributes will appear. Hence we may formulate the law:

II. As forms are multiplied by organization, attributes are correspondingly multiplied.

Speed.—Let us again consider bodies and particles in respect to the organization of speed, which is the third absolute. Motion is speed and path. By the organization of motion into force, speed becomes inertia or resistance to deflection, while path becomes velocity.

When a body is in motion in a straight line and another impinges upon it from the right or left, it is deflected; if the other body impinges upon it in the direction of that line from ahead it is turned back, or at least checked in its velocity proportional to its mass; if the impinging body strikes it from the rear, its velocity is increased. In all of these cases the change in the molecular motion of the body is the deflection of its particles. Here we must remember that the particles are deflected in all their components of path in vortex motion.

When forces have been produced, they may again be organized with other forces by pressure in an ascending series, and with every new force additional attributes will appear. Hence we may formulate the law:

III. When forces are multiplied by organization, attributes are correspondingly multiplied.

Persistence.—Let us now consider the same particles and bodies with respect to persistence, which is the fourth absolute category. The ultimate particle, which has persistence as an absolute, also has change as a relative. Persistence and change constitute time. When time is organized, it becomes causation, and the persistence becomes state and the state becomes event. When causation is organized with causation it becomes reproduction, while state becomes heredity and change becomes variation. Reproduction with heredity and variation are abstracts of the concrete known as parent and child. Causations may be partially organized when the parent becomes a number of offspring. This is fissiparous reproduction; but the complete organization of causations requires bisexual conjugation. Causation may be organized in an ascending series of bodies, and at every organization additional attributes will appear. We may formulate the law:

IV. When causations are multiplied by organization, attributes are correspondingly multiplied.

Consciousness.—Yet we have to consider the same particles and bodies from the standpoint of the fifth absolute.

When particles are organized into animate bodies, inference becomes conception, because consciousness becomes memory and choice becomes recollection. This is only primary conception. When concepts are organized with concepts, secondary concepts are developed and thus concepts are still further multiplied. Hence the law may be stated thus:

V. When concepts are multiplied by organization, attributes are correspondingly multiplied.

There is yet one more organization to be considered. This is a conventional organization of men or other animals into demotic bodies to accomplish purposes. By this method material bodies are not developed, but only ideal bodies. It has sometimes been called super-organization, but I shall call it *demotic organization.* It is but the continuation of the organization which begins with the forming of bodies from ultimate particles by affinity, but now it is the ideal organization of individuals into demotic bodies.

The fundamental demotic bodies exist in a hierarchy of units, so that every individual exists in an ascending series; for example, the man may exist in a township, and by reason of that he exists in a county, and by reason of that he exists in a state, and by reason of that he exists in the nation. But there are many ancillary societies to which he may belong. His ecclesiastical societies may be organized into a hierarchy of bodies. He may belong to various industrial organizations, to various organizations for pleasure, or, in fine, to any one or many of the organizations which men devise to accomplish their purposes.

Through every demotic organization attributes are multiplied. These attributes we call qualities. All qualities are good or evil and they depend upon the purposes entertained; thus purpose informs all the actions and activities of the universe.

When demotic bodies are organized, an entirely new class of concepts are evolved; they are concepts of qualities which are good or evil. They are properly grouped in five divisions as concepts of pleasure and pain, concepts of welfare and illfare, concepts of morality and immorality, concepts of truth and error, and concepts of wisdom and folly. This further multiplication of concepts gives rise to a vast multitude of attributes which must be considered as the most important factor in the totality of those we assign to bodies.

The Fundamental Classes of Bodies

The physical bodies of the universe are incorporated in an ascending series by discrete degrees of organization. A part of the ultimate particles of the universe is organized into molecules being integrated by affinity. Of the molecules that are incorporated, a part only remains in this condition without further organization. The larger part of these gases is contained in nebulæ. The study of nebulæ I shall denominate the science of *nephelonomy*.

Another part of the molecules is organized into stars, but the stars are composed of fluids in which the molecules are organized into forms. Forms do not appear in gases, but are first evolved in fluids and under gravity they assume the spheroidal form ; but the fluid portion of the stars is surrounded by a gaseous envelope. Stars are therefore both fluid and gaseous ; they are thus integrated by affinity and gravity, and differentiated as classes by chemism and into spheres by heat. Thus forms are organized of classes and these forms are again organized with classes that remain without form.

A still smaller part of the incorporated molecules are organized as forces in the planets and their satellites. Thus the planets have a higher organization than the stars. The planets are incorporated spheres with a fluid nucleus or centrosphere enveloped in a lithosphere, outside of which there is a hydrosphere and outside of this an atmosphere. The molecules of the planet are primarily integrated by affinity, further integrated by gravity, and still further integrated by lithifaction ; and they are differentiated by chemism, heat, and pressure. I call this science *geonomy;* but at the present time we can as a certitude speak only of the earth, though we may, with some show of reason, infer that the other planets of the solar system and other celestial spheres which are not stars have a like organization.

A still smaller part of the molecules are organized into plants. The bodies incorporated still require gas for their environment which they incorporate, they still require a fluid which they incorporate, and they still require solids which they incorporate. They have leaves which they spread in the air for the gas, and they have roots which gather the moisture and penetrate the solids ; and the plants themselves are gaseous, fluid, and solid. They develop a mode of motion which is called life. This is all accomplished by their organization of times into causations and of causations with causations to evolve reproduction. I call the science of these bodies *phytonomy.*

A still smaller part of the molecules of the universe are organized into animals. The bodies incorporated require for their organization plants in their environment which they devour; they require solids in their environment which they also devour; they require fluids in their environment which they drink, and they require gases in their environment which they breathe; and in the bodies themselves gases, fluids, solids, and plants are developed, and life is exhibited in their constitution. This organization is dependent upon the higher organization of mind, when concepts are organized from inferences and concepts are organized with concepts. I call the science of these bodies *zoönomy*.

There are five states of organized matter — gaseous, fluid, solid, vital, and mental. There are five systems of bodies that are organized out of these states of matter: they are molecules, the science of which is nephelonomy; stars, the science of which is astronomy; secondary celestial spheres, the science of which is geonomy; plants, the science of which is phytonomy; and animals, the science of which is zoönomy. In addition to this there are the ultimate particles exhibited in the ether, the science of which I call *ethronomy*, and there are ideally organized bodies, the science of which I call *demonomy*. Thus that which has been established by induction I have established by deduction. In the history of the development of science induction precedes deduction.

I have thus demonstrated that all natural and conventional or human organization is inspired by purpose. In this stage it is legitimate to inquire, What purpose?—to which the ready answer can be given, The betterment of condition. Until mind was organized in the animal world, this was accomplished by spontaneous choice on instantaneous occasion; but when mind was organized with memory, purpose was developed into design, or predetermined purpose. The purpose was betterment and the agency for betterment has always been coöperation.

Remark: The fundamental law of evolution is the law of affinity; but there are ancillary laws by which evolution is accelerated; the first was demonstrated by Laplace, though not named by him; it is the law of adaptation to environment. The second ancillary law was demonstrated in my volume entitled *The Geology of the Unita Mountains;* I named it "the instability of the heterogeneous." The third law was by Darwin, and it may be called the "survival of the fittest." The fourth law was demonstrated by Lamarck; it is the law of exercise. The fifth law was demonstrated by myself in 1883, and it is the law of culture. Thus evolution by affinity has been progressively accelerated.

Below are tabulated the twenty-five categories:

	Unit categories	Extension categories	Speed categories	Persistence categories	Consciousness categories
Absolutes........	Unity	Extension	Speed	Persistence	Consciousness
Relatives........	Plurality	Position	Path	Change	Choice
Quantities.......	Number	Space	Motion	Time	Inference
Properties........	Class	Form	Force	Causation	Conception
Qualities.........	Pleasure	Welfare	Morality	Truth	Wisdom

By a careful inspection of this table it will be seen that no one of the twenty-five attributes is like another, that no attribute in one column can be derived from an attribute in another column, but that the attributes in each column can be derived one from another in the order from above downward. Hence we may formulate the following laws or axioms for the categories:

Categorical Axioms

I. The unit categories are derived from unity.
II. The extension categories are derived from extension.
III. The speed categories are derived from speed.
IV. The persistence categories are derived from persistence.
V. The consciousness categories are derived from consciousness.
VI. One absolute cannot be derived from another of a different category.
VII. One relative cannot be derived from another of a different category.
VIII. One quantity cannot be derived from another of a different category.

IX. One property cannot be derived from another of a different category.

X. One quality cannot be derived from another of a different category.

We have already formulated the laws or axioms of the evolution of attributes, but will repeat them here.

Evolutional Axioms

I. As kinds are multiplied by organization, attributes are correspondingly multiplied.

II. As forms are multiplied by organization, attributes are correspondingly multiplied.

III. As forces are multiplied by organization, attributes are correspondingly multiplied.

IV. As causations are multiplied by organization, attributes are correspondingly multiplied.

V. As concepts are multiplied by organization, attributes are correspondingly multiplied.

In considering categories we must properly discriminate one from another. Unity must be discriminated from extension, extension must be discriminated from speed, speed must be discriminated from persistence, and persistence must be discriminated from consciousness. In like manner the five relatives must be discriminated, the five quantities must be discriminated, the five properties must be discriminated, and the five qualities must be discriminated. So also absolutes, relatives, quantities, properties, and qualities must be discriminated. The failure to make these discriminations is the source of many logical fallacies.

To avoid these fallacies the categorical axioms are given as the foundation of all deductive reasoning.

ANTLER-POINTED ARROWS OF THE SOUTHEASTERN INDIANS

By CHARLES C. WILLOUGHBY

In 1899 the Peabody Museum of Harvard University received as a gift from the proprietors of the Boston Museum Theater the valuable archeological and ethnological material which for many years had been preserved in the exhibition cases of the museum formerly connected with that institution. Many of these objects had previously belonged to the Charles Wilson Peale Museum (established in Philadelphia in 1785) and were collected in the eighteenth and the first part of the nineteenth century.

This material included several incomplete sets of arrows, probably obtained at an early date from some of the southeastern tribes. Examples of these are illustrated in plate X. *a* represents one of three arrows from a set; it is 30¼ inches long; the shaft of split hickory is without grooves, is about five-sixteenths of an inch in diameter at the center, and tapers gradually toward either end. The point is of antler, lozenge-shaped in cross-section, carefully finished, and painted red, the end of the shaft being inserted in a hole in its base. The feathering consists of three split feathers of the wild turkey trimmed to abrupt points at their lower ends. The two feathers bearing white blotches are wing quills, and the one with reddish-brown marking is from the tail. The feathers are seized at either end with sinew. The colored markings on the shaftment (the riband) are in red and black.

Plate X, *b*, in every way but the point, is a duplicate of *a*, and evidently belonged to the same quiver. The point is round in cross-section, is made from the tip of an antler prong, and has also been painted red. The base of the point is cut to form two barbs.

Plate X, *c*, belongs to a different set from the ones described. The shaft is made from a shoot of a shrub or small tree, and is feathered with three split feathers of the wild turkey, their lower ends trimmed to a tapering point. The riband is in black and red. The double-barbed point is of antler and is not painted.

Plate X, *d*, shows the best preserved of four arrows from a third set. The shaft, like that of the preceding one, is made from a shoot of a shrub with opposite leaves, probably the cornus. The feathers are of the wild turkey, split and trimmed to three-eighths of an inch in width to within one-eighth of an inch of the lower extremities. The remainder of the web is left uncut and forms a tail or trailer at the end of each feather. The riband is in red and black, and the unpainted antler point is furnished with two barbs. The principal differences to be noted between this arrow and the one last described are the riband and the trimming of the lower extremities of the feathers.

Unfortunately there is no record accompanying these arrows. We may assume, however, with a reasonable degree of certainty, that they were obtained from southern Algonquian tribes or from one of the neighboring stocks.

The hickory tree from which the shafts of plate X, *a* and *b*, are made, is found in that portion of Canada bordering Lake Erie, Lake Ontario, and St Lawrence river, in New England and the middle states, the northern and western portions of the southern states, and westward to central Kansas and Nebraska. This tree extended into the Siouan region and was used to a certain extent for bows by the Sioux and neighboring tribes.

In studying the arrows of historic primitive peoples of different parts of the world, we find that, excepting among the Indians of central and western North America and in a few other restricted localities, flint points seem to have been the exception. This may be explained in some sections by the absence of suitable stone for making arrowpoints. It should be remembered, however, that only a portion of the so-called flint arrowpoints found throughout America were ever attached to arrowshafts. The majority are probably rejects; many of them were knife blades attached to short handles, others were points to projectiles thrown with the hand or by the aid of some form of spear-thrower.

There is little evidence of the use of stone arrowpoints in New England within historic times. Gosnold in 1602 found the natives supplied with "copper" points, "some very red, some of a paler color" (brass?); Waymouth three years later saw arrows headed with points made from the long shank-bone of the deer; Champlain at about the same date found them tipped with the tail of the horseshoe crab; Mourt's *Relation* refers to arrowheads of brass, eagle claws, and hartshorn; Higgeson, writing in 1629, speaks of bone and brass arrowtips; Wood also mentions brass points, and writes of the feathering of the arrows with the wing and tail feathers of the eagle.

The Indians in several places in Massachusetts and southern Maine showed Champlain turkey-feathers "with which they feathered their arrows." The excellency of New England arrows is shown by the fact of their use as an article of trade with the tribes of the St Lawrence region, where Champlain found stone arrowpoints in use. None of the above writers refers to stone-pointed arrows within New England; they seem to have fallen into disuse at an early period. There are brief references to stone-pointed arrows in the regions adjoining the northern, western, and southwestern portions of New England. Holm mentions arrowpoints of stone, bone, horn, and the teeth of large fishes or animals among the Delawares; and Kalm refers to points made from stone, from the bones of animals, and from the claws of birds and beasts among the Indians of the same region. Smith mentions stone arrowpoints among the Virginia Indians. Beverly in his *History of the Present State of Virginia* (1705) refers to arrows of reeds or small wands fledged with turkey-feathers and headed with stone or the spurs of the wild turkey-cock. Adair, writing of the Cherokee, describes arrows pointed with "scooped" points of buckhorn, turkey-cock's spurs, and stone. Timberlake mentions points of brass, copper, bone, and the scales of a certain fish; he writes that some of the points were of triangular form, and were inserted in the split end of the shaft, which was usually made of a reed. The point was secured by wrapping the end of the shaft with sinew, and passing the cord through a perforation in the metal point (compare fig. 56). In the province of Cofachiqui, De Soto employed an Indian guide whose quiver contained arrows with reed shafts, some of them tipped with buckhorn wrought "with four corners like a diamond" (compare plate X, *a*), some with bones of fishes curiously fashioned, others with hardwood or with flint.

While stone-pointed arrows were doubtless used to a greater or less extent by all the tribes of the United States, some other material seems generally to have been preferred in certain sections, notably the east.

Besides the stone-pointed arrow the early Siouan tribes used arrows pointed with splinters of the leg-bone of the buffalo or elk ground thin and smooth. An old example of this type in the Peabody Museum has the shaft grooves and proportionally long shaftment characteristic of the Siouan arrows. The thin bone point is of the same general form as the iron points adopted later which were obtained principally from white traders.

There is ample archeological evidence that antler-tipped arrows of the type illustrated in *b*, *c*, and *d*, plate X, were used from Maine to Arkansas. The Peabody Museum in Cambridge and the American Museum of Natural History in New York have collections of these points in all stages of formation. They are all from the Algonquian area or the region immediately bordering it. The unfinished point shown in fig. 54, *a*, is from the shell-heaps of Maine. There are two other specimens from the same locality in the Peabody Museum collection.

Fig. 54, *d* and *e*, were taken with several others from a grave on Staten island by Mr George H. Pepper of the American Museum. Some of the points were found embedded in the bones of the skeleton.

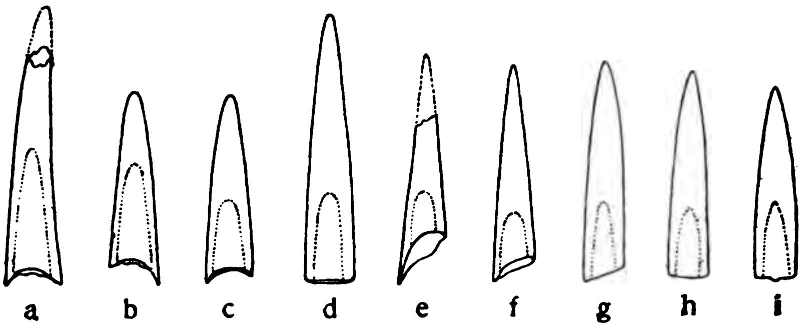


FIG. 54—Antler arrowpoints (one-half nat. size), *a*, Maine; *b*, *c*, Ohio; *d*, *e*, New York; f, Kentucky; *g*, *h*, *i*, Arkansas. *a*, *b*, *c*, *g*, *h*, *i*, Peabody Museum; *d*, *e*, f, American Museum of Natural History.

Fig. 54, *b* and *c*, are from the ash-pits of the village site and cemetery at Madisonville, Ohio. They were obtained by the score in all stages of manufacture, from the antler branch with the shallow, encircling groove marking the first step in the process of manufacture to the finished and carefully polished point.

Fig. 54, *f*, is from the village site and burial place near May's Lick, Kentucky, and was obtained with many others by Mr Harlan I. Smith who conducted the exploration for the American Museum. Specimens *g*, *h*, and *i* are from the mounds and village sites in Poinsett and Cass counties, Arkansas. A few of the points shown in outline are finished or nearly so. The others in the same figure are evidently rejects, discarded on account of some imperfection.

In the manufacture of these points the antler prong was encircled by a groove cut to the required depth at a proper distance from the point (fig. 55, *a*); the point was then broken off, drilled, and afterward cut and scraped to the required form, then ground and polished (fig. 55, *b*–*e*). The base of the point was cut either straight across or in such manner as to form one or two barbs.

Accompanying the antler-pointed arrows illustrated in plate X and doubtless obtained from the same general region, were eleven from a fourth set having triangular copper points smaller but of the same type as those of copper and brass occasionally found in the graves and village sites in New England. The copper point is perforated near the center, and is inserted for about half its length in a slot cut in the end of the arrowshaft to which it is bound by sinew, the cord passing through the perforation in the metal point (fig. 56), a method followed by the southern Indians and also by the Indians of New England.[1] The well-made shaft of split hickory is without grooves. The nock is expanding and the notch is deeply cut. The feathering consists of three differently colored split feathers of the wild turkey trimmed to a uniform width of a little more than three-eighths of an inch. These are seized at either end with sinew, the white-spotted feather taken from the turkey's wing being stained yellow. The riband

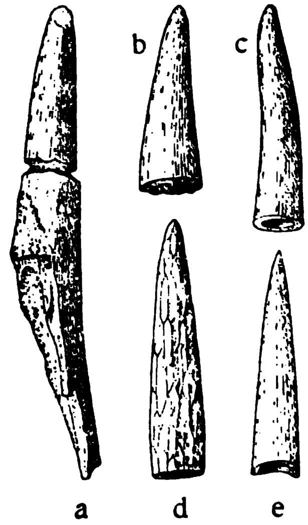


FIG. 55—Antler arrowpoints, illustrating process of manufacture. From village site and cemetery, Madisonville, Ohio. (Peabody Museum; one-half natural size.)

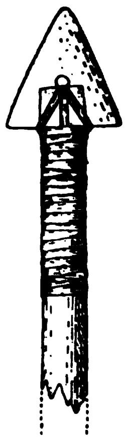


FIG. 56—Copper-pointed arrow of the southeastern Indians (full size).

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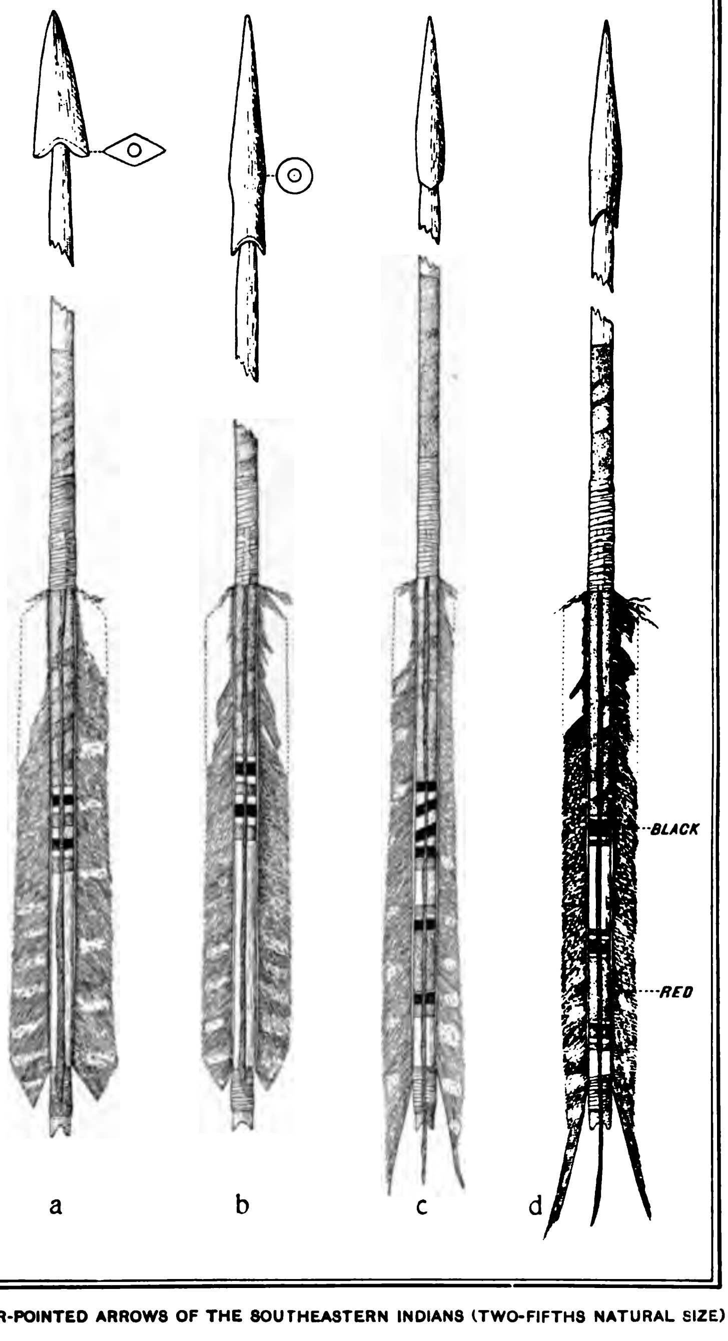
[1] The perforated, triangular brass arrowpoints found with the famous "Skeleton in Armor" Indian at Fall River in 1831 were attached to the shafts by a cord wrapped around the end of the shaft and passed through the perforation in the point. The upper portion of the shafts and the cord wrapping were preserved by contact with the metal. The "armor" and other metallic contents of this grave are fully described and illustrated in *Mémoires de la Société des Antiquaires du Nord*, 1840–1844, pp. 104–110 and pl. v. They are preserved in the Ethnographiske Museum at Copenhagen (with the exception of two of the brass tubes which are in the Peabody Museum at Cambridge), only the skeleton having been destroyed by fire at Fall River.



ANTLER-POINTED ARROWS OF THE SOUTHEASTERN INDIANS (TWO-FIFTHS NATURAL SIZE)

consists of two narrow encircling bands of red placed almost together near the center of the shaftment, and two additional bands of red at either end of the sinew wrapping which holds the feathers farthest from the nock. The sinew wrapping below the copper point is also painted red.

In studying the arrows of the tribes inhabiting the region east of the Mississippi it should be remembered that the full-sized bow of the Iroquoian tribes and the Atlantic coast Algonquians measured approximately five and one-half to six feet, with arrows of proportional length. The hickory self bow taken from an Indian at Sudbury, Massachusetts, in 1664, and now in the Peabody Museum, measures five feet six inches. The unique Abnaki compound bow belonging to Big Thunder, a Penobscot Indian, measures about five feet seven inches in length. The various accounts by early writers and the drawings by John White (1585) and other early artists, of the southern coast tribes, show that the shorter bow of the Algonquians of the interior and other tribes of the west was not commonly used by the coast Indians. Judging by the length of the antler- and copper-pointed arrows herein illustrated, they were used with bows of medium length and probably belonged to interior southeastern tribes.

THE LESSER NEW-FIRE CEREMONY AT WALPI

By J. WALTER FEWKES

Introduction

Fire is or was regarded by the Hopi Indians of northeastern Arizona as a living being, its cultus consisting primarily of rites for germination, and, secondarily, for rain-making. When " new fire " is ceremonially kindled, this act and the accompanying rites are " prayers " to the Fire-gods, or, what is practically the same thing, to the personations of great magic powers, male and female, which generate or " create " living beings.

The Greater New-fire festival[1] occurs at Walpi in November and is celebrated by all male adults of the pueblos on the East Mesa of Tusayan. The "gods" worshiped at that time are (1) the male Germ-god, *Masauû*, God of Fire and ruler of the abode of the dead; and (2) his female complement, the Germ-mother, called *Alósaka*-woman or *Talatumsi*, and *Tuwapoñtumsi* or Earth-woman.[2]

The festival is celebrated at Walpi[3] in an abbreviated and an elaborate form, and is the most complicated ceremony performed on the East Mesa.

There is another Fire festival, of much less complication and possibly of different geographical origin, performed in the two East

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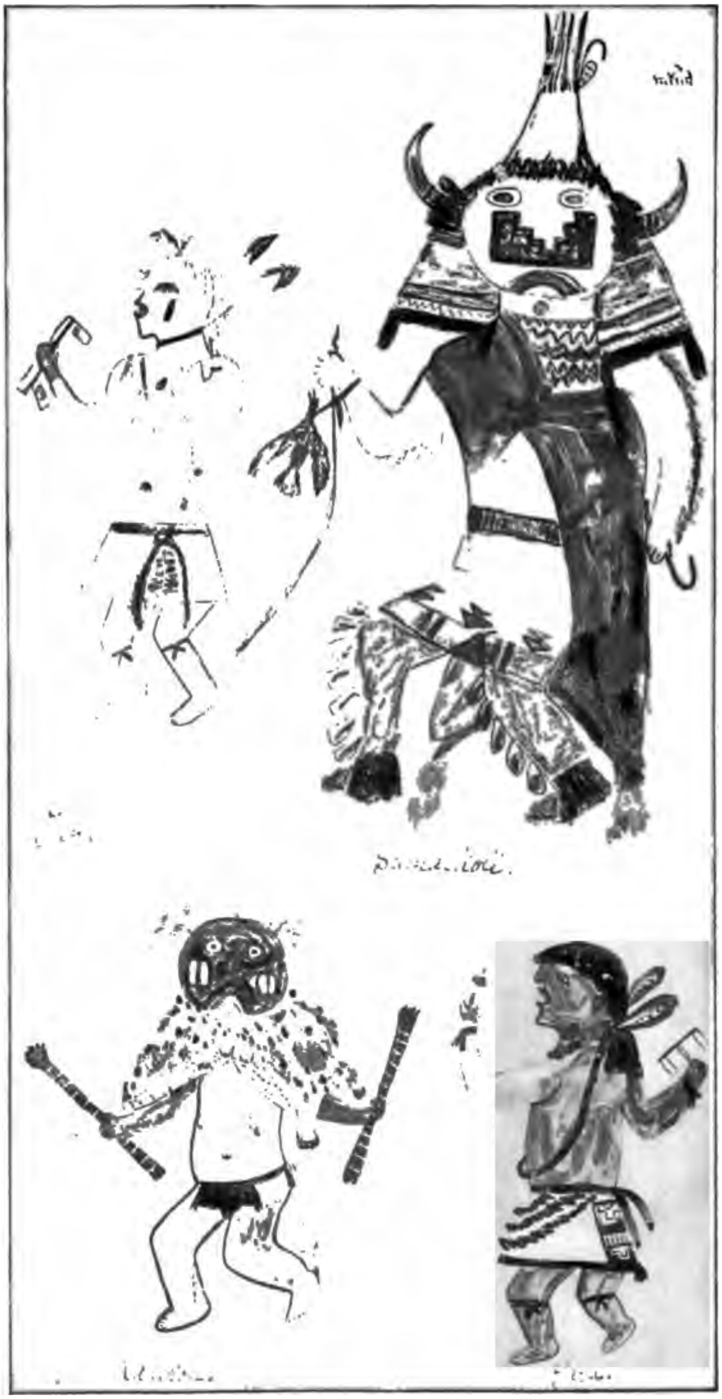
[1] " The New-fire Ceremony at Walpi," *American Anthropologist*, o. s., 1898.

[2] Talatumsi is so called because her idol is worshiped at sunrise (*tala*); *Alósaka*-woman because at Awátobi, from which pueblo her cult was derived, her complement, the Germ-god, was called by this name. The Earth-woman (*Tuwapoñtumsi*) is represented by a log of petrified wood, an archaic personation of Mother Earth. (For an illustration see " The New-fire Ceremony at Walpi," *op. cit.*)

[3] It was in part derived from Awátobi, a Hopi pueblo destroyed two hundred years ago, and may justly be supposed to contain many ceremonial survivals of that ill-fated village.



NATIVE PICTURES OF SUMAIKOLI, KAWIKOLI, AND YAYA PRIESTS

Mesa pueblos of Hano and Walpi. This festival is controlled by a single priesthood, still represented in New Mexican pueblos. The Hopi call it *Sumaikoli;* in this article it is designated the Lesser Fire ceremony. As the *Sumaikoli* is much simpler than the *Wüwütcimti*, or Greater New-fire ceremony, its meaning is less difficult to discover, the essentials in it not being obscured by secondary accretions. This meaning is found to be identical with that of the Greater New-fire ceremony, that is, a "prayer" to *Kokyan-wüqti*,[1] with added prayers to the Sun, Moon, *Masauû*, and the cardinal points.

The *Sumaikoli* is a special ceremony of a fraternity of priests called the *Yaya*, and occurs in the months of July and March. It has no connection with the Greater New-fire festival in November, which is controlled by four other fraternities.[2] Two of the East Mesa pueblos celebrate this lesser festival, and as one of these, Hano, is a Tanoan village, the author believes that it was introduced from New Mexico by Tanoan clans—a conclusion supported by the fact that it is not observed at Oraibi, where the influence of colonists of this kinship is less marked than at Walpi. While the fact that it is celebrated in Hano is enough to betray its Tan'oan derivation, there are other arguments which point to the same origin. Its name is not Hopi, and its chief, Simotci, belongs to a clan generally identified as of eastern, possibly of Tanoan, origin.

The summer or July *Sumaikoli* at Hano was first witnessed by the author in 1891; he has never seen the spring presentation of this festival at that pueblo, for the old chief, Kalacai, died about 1892, and his successor did not give the performance in 1900, when the author was living in the neighborhood. The chamber in which the masks and other paraphernalia are kept has often been visited in recent years and the objects have frequently been inspected by the author and his friends.

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[1] Spider-woman, an animal personation of the magic power of Earth; called, in the Greater New Fire, *Alósaka*-woman or *Talatumsi*, and *Tuwapoñtumsi*. Also known as Old Woman, *Müyiñwû*-woman, and by numerous other names.

[2] Almost all the great Hopi festivals have a major and a minor celebration of their mysteries, occurring six months apart, but *Sumaikoli* is not a minor celebration of the *Wüwütcimti*.

So far as known, the only published pictures of the public masked *Sumaikoli* are those of Dellenbaugh,[1] who, however, fails to add any new facts that would lead to an interpretation of its meaning. The Hano *Sumaikoli* has already been described,[2] but up to the present time nothing has been published on the Walpi variant. The present account is based on notes made in March, 1900, while the author was engaged in ethnological work in Arizona for the Bureau of American Ethnology.

THE YAYA PRIESTS

The fraternity of priests known as the *Yaya* is an ancient one, represented by distinct organizations in both Hano and Walpi. From existing legends it appears that this fraternity had much greater power in ancient than in modern times, and was formerly more conspicuous in the ritual.[3] The living members claim for their predecessors most extraordinary power over fire and recount incredible stories of their magic. These latter are practically believed by the older members, who say that they have witnessed the events described. They assert that members of the priesthood once swallowed fire without harm; were able to leap into a bonfire uninjured, and could carry bundles of fagots about the plaza until their bodies were covered with burns and their hair consumed, without suffering either pain or injury; while their magic power over fire is said to have been so great that they could cure its ill effects on the human body.

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[1] *North Americans of Yesterday*, New York, 1901.

[2] *Journ. Amer. Eth. and Arch.*, Vol. II. The row of objects called "shields" in this description are not war-shields, but masks or "face-shields." They are called *sumaikoli*, and the personators who wear them bear the same name. The ceremony is likewise called *Sumaikoli*, but the priests who control it are known as *Yaya*. The signification of the terms *Yaya* and *Sumaikoli* is unknown to the writer.

[3] The accompanying figures (plate XI) show the costume and paraphernalia of a *Yaya* priest. Attention is called to the peculiar framework rattles which these priests carry in their left hands. The original drawings, here reproduced, were made by a Hopi Indian.

Numerous other stories of the marvelous magic of the early priests are current among their present representatives. The ancient *Yaya* were accustomed, it is said, to seat themselves on the edge of the mesa and throw themselves, without harm, headlong to the plain several hundred feet below. A member of the old priesthood, they say, performed the following deed by his magic power: The "Giant's Chair" is a large butte visible from the Walpi plaza, although over thirty miles distant. One of the *Yaya*, in presence of many spectators, took his stand in the plaza, holding in one hand a bowl of white pigment and in the other a fragment of cloth; he dipped the cloth in the pigment, held it up before the witnesses, made a pass in the air as if rubbing the distant butte, and his power was so great that the mountain turned white. Shortly afterward the same man made another pass with his hand, and the Giant's Chair resumed its ordinary dark or black color. Many other marvelous stories are told of the magic powers of the ancient Fire-priests, but those cited will serve to show their general nature.

At the present time, although much less important than formerly, the *Yaya* priests are still believed to have great shamanistic power in curing disease. Their method of treatment is quite prevalent in primitive medicine, based on reasoning by analogy, so constant in savage philosophy. For example, skin eruptions present analogies to the effect of fire; they itch or burn, hence they can be cured by fire or its products—heat, ashes, and the like. By application of charcoal or ashes the *Yaya* claim to cure burns, scalds, or skin eruptions of various kinds. Heated rocks tied to a broken leg are supposed to heal the fracture.[1] By their magic power over fire and its products the *Yaya* counteract the magic power of those who cause these disorders, for disease to primitive man is the product of sorcery or the malevolent magic of an enemy.

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[1] The author witnessed a *Yaya* shaman, Nŭvawinŭ, make use of ashes in the treatment of a burn on a woman's neck. He filled his mouth with charcoal and ashes, chewed them, and squirted the mixture, Chinese fashion, on the afflicted part.

GENERAL REMARKS ON THE SUMAIKOLI

It is customary for the priests to indicate the existence of secret rites by objects placed near the entrance of the room in which they are performed. The *Yaya* priests use for this purpose two small feruled sticks and a spherical gourd attached to the end of a rod inserted in the straw matting which ordinarily serves as a cover for the kiva entrance. These objects were placed on the *Alkiva* during the *Sumaikoli* ceremony in 1900.

The rites witnessed by the author lasted one day, having been opened early in the morning by the kindling of a new fire. Shortly after noon this fire was carried by couriers to four shrines of the Fire-god. The interval between these two events was occupied in the manufacture of prayer-sticks and in their consecration by prayers, songs, smoking, and invocation to a personation of Mother Earth called *Kokyan-wüqti*, or Spider-woman.

The following events occurred at Walpi on the single day of the *Sumaikoli* festival:

1. Fire kindled by friction.
2. Manufacture of prayer-offerings (later enumerated.)
3. Consecration of the prayer-offerings ; prayers.[1]
    - *a.* Ceremonial smoke.
    - *b.* Verbal prayers.
    - *c.* Songs.
    - *a.* Invocation to Spider-woman.
    - *e.* Verbal prayers.
    - *f.* Ceremonial smoke.
4. Couriers carry fire and prayer emblems to four shrines.

A minute description of these events cannot here be given, although their details were carefully studied and recorded[2]; but

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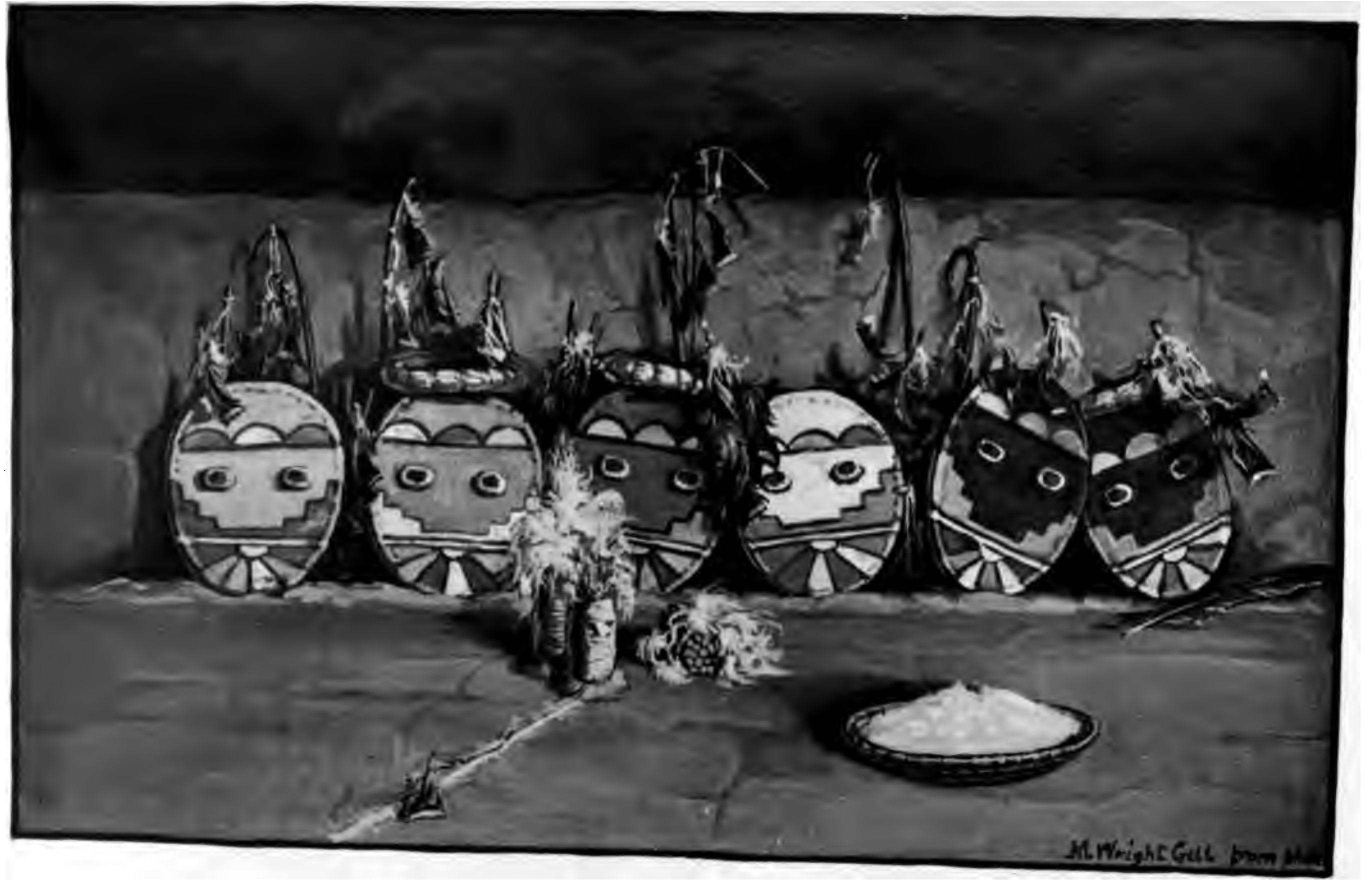
[1] The word "prayer" is here used in its broadest sense, including all the means by which the worshiper makes known his desires.

[2] This article is preliminary to a complete and more elaborately illustrated description of the rites, especially those before the altar when the songs are sung.



SUMAIKOLI ALTAR AT WALPI

a brief notice of their general character will be presented, with suggestions as to their significance.

SIGNIFICANCE OF THE SUMAIKOLI SECRET RITES

A secret ceremony may be considered from the following sides:

1. From that of the paraphernalia used — a description of the ceremonial objects (*wimi*), their installation on or about an altar, and their symbolism.

2. Means by which the magic power of the paraphernalia is quickened, and those by which that action is directed to obtain desired results. These means are commonly called prayers.

3. Prayer-sticks and, in the case of *Sumaikoli*, prayer-fire by which the prayers are carried to the shrines of the gods.

1.—*The Sumaikoli Wimi Installed in an Altar*

Every Hopi religious fraternity has a collection of fetishes and other objects which it makes use of to bring about certain results. The possession and knowledge of how to use these objects, or *wimi* as they are called, gives the name *wimkya* to a Hopi priesthood. The *wimi* are practically all the paraphernalia of worship—idols, painted slats, symbols, masks, and other objective material used in the ceremonies. An altar is their prescribed installation, and may be simple or complicated according to the number and character of the objects. The *Sumaikoli* altar (plate XII) consists of a row of disks, or shield-like bodies which, from the fact that they are sometimes worn on the head and have faces depicted on them, will be called face-shields. These disks are set side by side on the floor of the kiva with their edges touching; they are painted with the same symbols, although their colors vary considerably. Since there are six of these face-shields or masks, with colors corresponding to those of the six cardinal world-directions of the Hopi, they symbolize those points, viz., north, west, south, east, above, and below; or, beginning at the right, yellow, green, red, white, black, and black (called also *kawikoli*).

Two objects, called *tiponis*, one of which belongs to the chief, Simotci, are placed on the floor before the row of face-shields. They are badges of chiefs and are called "mothers," for they are the most precious of all altar *wimi*. From one of these, as is customary in all altars, a line of meal, upon which is laid a string with attached feathers, is drawn along the floor toward the ladder which forms the exit from the room. This line symbolizes a trail along which the magic power of the *wimi* is supposed to pass.

One of the most important objects[1] on the floor before this line of face-shields, and by the side of the *tiponis*, is composed of many black sticks tied together like a fascis and ornamented with attached feathers. This fetish is called Spider-woman and represents one of the dual supernatural beings worshiped in the *Sumaikoli*.

2.—*Means of Quickening and Directing the Magic Power of the Sumaikoli Wimi*

Under this heading is included what is ordinarily covered by the expression "making medicine." The rites which occur around a medicine-bowl or before an altar are supposed to quicken the magic power of the medicine or *wimi*. At the same time these rites are prayers and serve to make known the wishes of the participants. Several kinds of prayers are used in the *Sumaikoli*:

A. Kindling the new fire. The priests want germs of life to develop. The priest kindles fire, or makes life, thus directing the God of Fire or Life to do likewise.

B. Verbal prayer. The priest makes known by words how he wishes the magic powers to act.

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[1] This object was not unwrapped by the priests while the author was present, but, judging from the contents of similar "baskets" in the *Lalakonti* which the writer was permitted to inspect in 1891, it probably contains many seeds, pigments of various kinds, and possibly shells and other articles.

C. Song prayers. Rythmic vocal directions to the gods indicating the ideas of the priest.

D. Pantomimic or symbolic prayer, otherwise designated as "prayer by signatures." Ceremonial smoking is a good illustration of this kind of prayer. A cloud of tobacco smoke resembles a rain-cloud;[1] a rain-cloud brings rain; therefore, by analogy, making smoke brings rain.[2]

a. Kindling the new fire by friction.—The new fire is kindled in the *Sumaikoli* ceremony in substantially the same way as in the November New-fire ceremony, elsewhere described; but attendant rites in the former are less complicated than in the latter, where only one fraternity of priests participate.[3] Two sticks were used in kindling the fire, one of which we may call the twirler, the other the notched firestick. The former is regarded as male, the latter female.[4] In making the fire the notched firestick is placed on the floor and the twirler is inserted in a small depression near its edge. The twirler, which is held between the open hands, is rapidly rotated; pollen (the male prayer symbol) is added, and finally, through friction, a grain of ignited dust falls from the cavity, through a notch, on shredded cedar-bark placed on the floor beneath the notched firestick; this is fanned into flame by means of which the fuel in the fireplace is ignited.

b. Verbal prayer.—This form of prayer is a direct appeal to the gods, either by means of comprehensible language or through mere meaningless sounds. In the *Sumaikoli* prayers there is one good example of the latter. At the culmination of the rites, while songs are being sung, the chief, Simotci, kneels on the floor by the side of the fetish, puts his mouth to a hole in the floor (which is said to communicate with the Underworld home of the Earth Mother), and yells several times, "*Ya-á-he-he-he!*" These meaningless syllables are invocations to the Spider-woman for the germination of seeds and other life.

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[1] In seasons of great drought the Navaho are said to kindle great forests or to make other fires in order to create a great smoke which "causes rain." Here is involved the same idea as in smoking with the mouth, but carried out on a much larger scale.

[2] This fallacy is a very natural one when the true character of smoke and clouds is unknown. Superficially they resemble each other to the primitive mind, hence they are identical and both have the same powers.

[3] The author arrived at the kiva too late to witness the *Yaya* kindle their new fire, but he saw the twirler and notched firestick on the floor and the fire burning in the fireplace, and was told that the fire had just been made by friction. There was every evidence that the fire had been made only a few minutes before he entered the room, which statements of the priests confirmed.

[4] The designation of the twirler as male and the notched firestick as female is common among primitive men. The latter is sometimes carved in the form of a woman or bears a female symbol.

3.—Means by which Sumaikoli Prayers are Conveyed to the Gods

In Hopi methods of worship an object or symbol bears the prayers to the gods. These objects have magic power, are quickened and directed as already mentioned, and are carried to shrines or (symbolic) dwelling places of gods, where they are supposed to exert the magic powers imparted to them. They may be said to "speak" to the gods. The two types of these objects in the *Sumaikoli* ceremony are prayer-sticks and prayer-fire, both of which convey the magic power of the *wimi* to the shrines of the gods for whom they are intended. An enumeration of the gods for whom they are made and to whom they are sent reveals the object of the ceremony. Prayer-sticks bearing the names of the following were noted: 1, Sun; 2, Moon; 3, *Masauû;* 4, Unknown; 5, Cardinal points. The first four were the same as the prayer-sticks of these gods made in other rites; the last were twigs, eight in number, to which were attached stringed feathers. The prayer-sticks and the prayer-fire were distributed by four couriers, who carried also symbolic food consisting of ground *píki* (paper bread), *pígume* (dried pudding), and fragments of peaches. Each courier was naked and carried a cedar-bark torch which was ignited at the kiva fireplace. With these lighted torches in one hand, the couriers shouted as they ran through the pueblo, and rushed down the trail to the *Masauû* shrine[1] situated in the foot-hills north of the pueblo. When they had arrived there they placed the prayer-sticks in the shrine and hastily gathered a pile of such twigs and other bits of wood as were available. This pile they ignited, then immediately left the place, making a quarter circuit of the mesa to a second shrine, situated west of the village, where they made a second fire, and so on to the south and east shrines, at each point kindling and leaving a small fire and feather and other offerings to the Fire-god and other gods. They then returned to the kiva on the mesa. In elaborate performances of the *Sumaikoli*, distribution of the fire and other prayer-bearers is more public, and it is said that the prayer-fire is carried to the shrines by men wearing face-shields, but this the author has never seen.

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[1] Called the "great *Masauû* shrine." This "house" of the Fire-god is figured in *Jour. Amer. Eth. and Arch.*, Vol. II. The sticks and twigs upon it are deposited by returning wood-gatherers as prayers to *Masauû*.

There is this essential difference in the distribution of the offerings in the *Sumaikoli* and the *Wüwütcimti*. In the latter, prayer-fire is carried to the four kivas and not to the shrines of *Masauû*, for a personation of *Masauû* sits in the kiva while the fire is kindled, and prayers are made directly to him. Two societies of priests carry offerings to the Germ-mother[1] immediately after the new fire is kindled in the November festival.

On the evening following the events above described, there were songs and possibly ceremonies in the kiva which escaped the author's attention.[2]

PUBLIC EXHIBITION OF SUMAIKOLI

It will be noted that there is no mention of a public exhibition of masked men in the *Sumaikoli* of Hano pueblo[3] or in that of

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[1] As a personation of the Fire-god sits in the kiva while the fire is being kindled, there is no need to carry prayer-fire to his shrines in the Greater New Fire; but there is no personation of the Germ-mother in the room at that time, consequently the priests visit her shrines. In the *Sumaikoli* there is no personation of *Masauû* in the room where fire is kindled, hence prayer-fire is borne to his shrines; but as the Germ-mother (*Kokyan-wüqti*) is represented by a fetish, there is no visit to her shrine in the *Sumaikoli*.

[2] The author was unable, from exhaustion, to witness this part of the *Sumaikoli*, as constant vigils in the kivas in March taxed his strength to the utmost.

[3] See *Journ. Amer. Eth. and Arch.*, Vol. II.

Walpi here described. All the rites occur in the kiva, and the public sees nothing except the fire couriers rushing through the pueblo and down the mesa side to the shrines as above mentioned. On some occasions, however, the face-shields or masks which are so conspicuous on the altar are worn in public. Various masked men, representing *katcinas*, likewise participate in these performances. The author has no photograph of this event, but has introduced a drawing (plate XI) representing a *Sumaikoli* and a *Yaya* priest as they appear at that time,[1] and a *Kawikoli* with another priest. Mr Dellenbaugh figures other masked men, one of which he calls "*Hobobo.*" From the fact that the masks are sometimes worn in public exhibitions of the *Sumaikoli*, we learn that the festival becomes at times more elaborate and are led to the conclusion that the couriers who bear the fire sometimes wear the face-shields so prominent on the altar (plate XII).

It is said that incredible feats with fire, which legends declare were formerly performed during the *Sumaikoli* ceremony, took place in public at this stage of the festivities. It is claimed that a Hopi fire-dance was once performed which rivaled that of other tribes, and it is possible that these public exhibitions somewhat resembled the fire-dance of the Navaho; but as the author has never seen either, he is unable to express an opinion on this point, nor is he able to make any comparison with the variants of the *Sumaikoli* which survive among Pueblos not of Hopi stocks. Survivals no doubt exist in several pueblos, but, so far as the author knows, nothing definite has been recorded concerning their character.

CONCLUSIONS

1. The *Sumaikoli* ceremony is a fire festival of the *Yaya*, or Fire-priests, in which fire is ceremonially kindled with secret rite. and masked beings sometimes appear in public.

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[1] The drawing from which this was copied was made by a Hopi familiar with the public exhibition of the *Sumaikoli*. Although the face-shields bear representations of eyes, the *Sumaikoli* are said to be blind.

2. The festival was introduced into the ritual of Walpi from Zuñi, the Rio Grande pueblos, or directly from Hano where it is still observed.

3. Its purpose is primarily a prayer for the germination of life, to which are added those for rain and other blessings.

4. The special gods " worshiped " are the Germ-father and the Germ-mother.

5. The Germ-father, here called *Masauû*, the Fire-god, is communicated with by means of prayer-sticks placed in his shrines or prayer-fires kindled in the vicinity of the same.

6. The Germ-mother, called in this ceremony by the name of her animal personation, *Kokyan-wüqti* (Spider-woman), is communicated with by invocations consisting of archaic monosyllables shouted by the chief.

7. The *Sumaikoli* are ancients of the *Yaya* priests, and their personators wear face-shields bearing traditional symbols when they dramatize the ancient ceremony. A face-shield or mask has magic power, and its presence on the altar is a symbolic or mute suggestion of the elaborate ceremony of the ancients.

8. A comparison of the *Sumaikoli* and *Wüwütcimti* ceremonies shows that the Germ-mother has different names among the Hopi. In the Greater New-fire festival we find her called *Talatumsi* or *Alósaka-wüqti*, and *Tuwapoñtumsi;* in the Lesser, *Kokyan-wüqti*. These and several other names applied to the same personage betray the composite character of Hopi mythology. By the same theory the Germ-god, who is called *Masauû*, the Fire-god, in the New-fire rites, is elsewhere known as *Eototo*,[1] and appears in other rites also as *Müyiñwû* and *Alósaka*. The

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[1] The mask of *Eototo* is white, that of *Masauû* black ; but the symbolism and paraphernalia of the two are identical. There are several reasons which lead the author to suspect that *Eototo* is the old Germ-god of the ancient pueblo of Sikyatki : (1) He is personated by the chief of the *Kokop* clan which once lived at that pueblo ; (2) There is said to have been an *Eototo* clan at Sumaikoli ; (3) The personator of *Eototo* in the *Soyáluña* utters Jemez or Keresan words to the effigy of the Great Serpent, and legends agree that the people of Sikyatki came from Jemez.

author does not believe that these several designations denote different gods, but regards them as attributal or special names of one great magic male power, the Sky-god, whose appellations vary with different clans. *Masauû*, *Müyiñwû*, *Eototo*, and *Alósaka* are different names for the same god—the Sky-god, whose house is the Underworld and whose shield or mask is seen in the sun's disk.

It has thus happened that the dualism of sex in nature has been early recognized and exalted into a great genitor and genitrix—the former, magic power of sky, the latter of earth. These two powers, according to the philosophy of primitive man, have always existed, and man, animals, plants, and lesser gods have been born from these two—not created, but born. An artificer or creator is unknown to lower races in their primitive status. Cosmogony is not a proper term to apply to natal legends of a race who have no idea of a cosmos, and so-called creation myths are simply stories of how races of men and animals, themselves often mythic, were born from Earth and Sky. The names of these two parents may vary greatly and their powers be ascribed to animal personations,—a giant bird or snake or a combination of the two may in course of time be spoken of as the Sky-god, and a spider or a mole as the Earth-goddess; the sun (shield or mask of the former) may commonly be regarded as the Sky-god. All may be elevated into "creators" by students who seek an artificer of nature as a whole among the myths of lower races. There is every probability, however, that primitive man, if he ever thought of the question, universally believed that earth, sea, and sky always existed, and that in his first essays to discover causes he limited himself to the question how the first animals and man were born. Many races recount how their ancestors were born from Mother Earth, and claim that their father was a Sky-god or some animal personation of the same.

It is known that the Hopi people were formed by the union of different clans which from time to time have drifted together, and that prior to consolidation each group of clans had developed its own pantheon to the members of which it had given its own names. These names survive in some instances, but probably in others they have been lost. While they represent in a general way the same conception, they have not exactly the same significance—Zeus and Jupiter are in a general way the same god, yet not identical, although many generations of scholars confounded them. The gods of each Hopi clan differ slightly, for the past environments of these clans have not been alike. In the amalgamation of clans into a tribal people, differences of language have been merged into a common language and clan conceptions of gods have followed the same laws of unification.

The present Hopi idea of a Sky-god is a more or less composite conception—a generalization of magic powers of meteoric phenomena, each of which was once regarded as a separate god with a special name. Lightning, wind, rain, germination, sun, were all once given separate magic powers or were gods. Amalgamation of clans led to generalization in which the Sky-gods were all merged into one, and meteoric phenomena became attributes or "servants" of one Sky-god. While much can be said in support of a belief that a conception of a Sky-god, or recognition of the magic power of the firmament as a whole, was the primitive one from which attributal magic powers, as those over lightning, rain, and fire, have been differentiated, the author believes that the conception of a Sky-god so far as it is monotheistic is due to integration, resulting from union of clans, each of which emphasized into a god some special phenomenon of the sky.

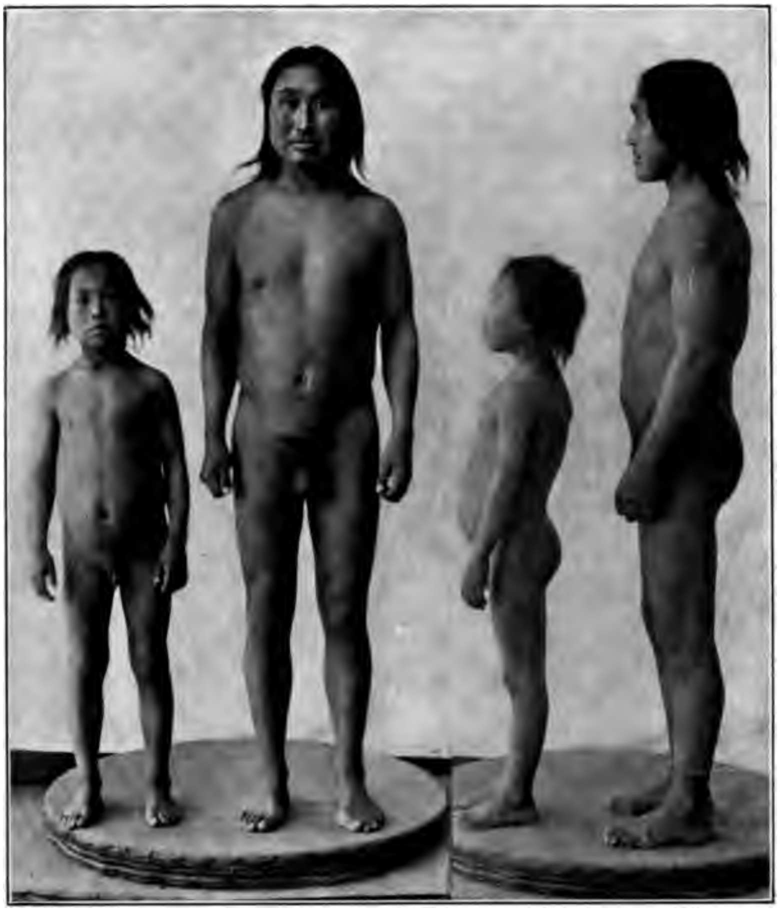
The keynote of primitive religion is sympathetic magic. "Man," writes Tylor, one of the greatest ethnologists of our generation, "as yet in a low intellectual condition, having come to associate in thought those things which he found by experience to be connected in fact, proceeded erroneously to invert this action, and to conclude that association in thought must involve similar connection in reality. He thus attempted to discover, to foretell, and to cause events by means of processes which we can now see to have only an ideal significance. By a vast mass of evidence from savage, barbaric, and civilized life, magic arts which have resulted from thus mistaking an ideal for a real connection, may be clearly traced from the lower culture which they are of, to the higher culture which they are in. . . . Magical arts in which the connection is that of mere analogy or symbolism are endlessly numerous throughout the course of civilization." The primitive mind associates fire with life, and comes to believe that this association of ideas exists in reality. By the symbolic act of kindling new fire, the Hopi priest believes that he can cause the gods to make corn germinate.

DESCRIPTION OF THE PLATES

PLATE XI. The two upper figures represent a *Sumaikoli* preceded by a *Yaya* priest. The *Sumaikoli* wears a face-shield more like that of Hano than of Walpi, but it differs from both in several particulars. The curved bodies, one on each side of the head, represent horns; the apex of the head ornament has feathers and a crook with a symbolic ear of corn. The face bears a rain-cloud symbol and an embroidered sash is tied to the back of the head. He wears a kilt decorated with triangular rain-cloud symbols, and a buckskin shirt over which is hung another buckskin garment, painted red in the original. Along the side of each leg is a row of conical shells cut from a conus and called *mosilili*. A fox-skin hangs from the belt behind, and the anklets are of red horse-hair.

The *Yaya* carries in his right hand a curious rattle made of a framework sliding on a handle. This is somewhat better shown in the figure in the lower right-hand corner of the plate.

The remaining figure, *Kawikoli*, wears a spherical helmet like that of *Masauû*, with two white marks on each cheek; on each side of the head are bunches of *nakwakwocis* or feathered strings representing prayers. There is a mountain-lion's skin over his shoulders, and he bears an ignited cedar-bark torch in each hand.



KISHU AND MENEE (PHOTOGRAPHED ON THEIR ADMISSION TO BELLEVUE HOSPITAL)

(Cephalic index 76.26.)

Height (from line joining the aud. meati to bregma) about	14.2 cm.
Circumference maximum of the head	56.8 cm.
Diam. biauricular (between the depressions over the roots of zygomæ, in front of the ear)	13.2 cm.
Diam. frontal minimum	10.4 cm.
Diam. bigonial	11.1 cm.
Diam. bizygomatic max.	14.5 cm.
Height of face: chin to nasion	12.3 cm.
chin to interciliary line	14.3 cm.
chin to insertion of hair	20.0 cm.

These measurements agree in the main with those which I made of the other Eskimo from the same locality, thus showing that Kishu was not racially exceptional.

The scalp was found to be less than the average in thickness; this was undoubtedly due to advanced general emaciation. The skull was entirely symmetrical; the sutures mostly still pervious; skull-cap thin. No adhesion of the dura; the soft membranes normal. Several masses of Pacchionian granulations over the longitudinal sinus. No signs of tuberculosis,[1] nor any other pathological lesion, within the cranial cavity. Very small quantity of fluid. There was a pronounced pigmentation of the pia and arachnoid from the pons to over and below the calamus scriptorius.

Weight of brain, denuded of dura mater, after a few minutes' exposure for drain, 1503 grammes.[2] The specimen was laid in 20 parts 5 % formaline and 80 parts 95 % alcohol.

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[1] The brain and the heart were about the only organs in which no tubercular lesions were found.

[2] Mean weight of white male brain in 154 men of mean height of 1.680 m. equals 1361.5 grams (Broca); mean weight of white male brain in 168 men of mean height of 1.679 m. equals 1357.5 grams (Manouvrier).

Examination of the Brain

(Three weeks after death)

Weight

The brain and its principal parts, denuded of the membranes, weigh, after 15 minutes' drainage, as follows:

Whole encephalon	1325.0 gr.
(Loss in three weeks through solution and through loss of membranes	178.0 gr.)
Cerebrum	1155.0 gr. or 87.17% of the total.
Right hemisphere	577.0 gr.
Left hemisphere	578.0 gr.
Cerebellum	142.0 gr. or 10.72% of the total.
Pons and bulb	28.0 gr. or 2.1% of the total.

The proportions of the cerebrum and cerebellum to the whole brain are very nearly like those of whites,[1] but the relative weight of the pons and bulb is slightly greater.

GENERAL OBSERVATIONS

CEREBRUM

The hemispheres in general are very well developed. The gyration is pronounced and rather more complex than that found on the brains of average whites. The principal sulci are deep. The thickness of the gray matter shows no appreciable difference from that observed in the brains of whites. The gyration of the left hemisphere is perceptibly more complex, particularly in the frontal lobes, than that of the right. A striking feature is the predominance on both hemispheres, but more especially on the right, of vertical gyration.

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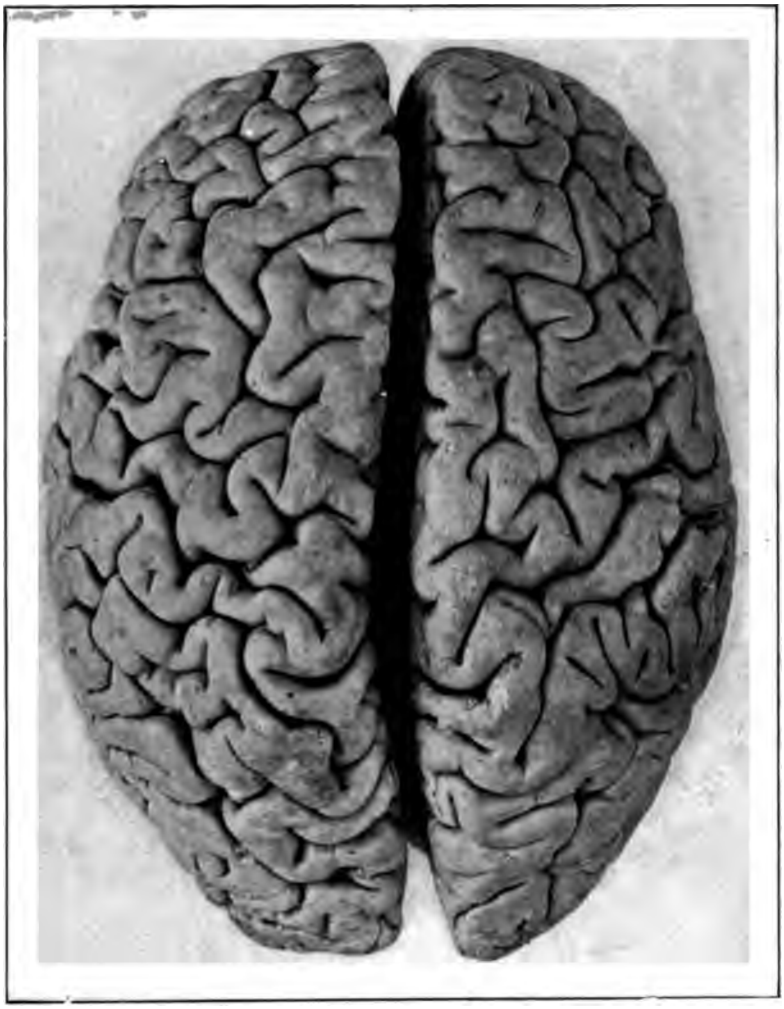
[1] In the white brain, the proportionate weight of the cerebellum, medulla, and pons together is to that of the whole brain in the adult as 13 to 87 (Huschke). The cerebellum is 10.7 of the total encephalon (Meynert). According to Broca, the relative weights to that of the whole encephalon are: cerebrum, 87.3%; cerebellum, 10.6%; pons and bulb, 1.91%. As to the hemisphere, in 264 men Broca found the right to be the heavier in 138 cases, the left in 105 cases; the weight was even in 21 cases.



KISHU'S CEREBRUM (DORSAL ASPECT)

The hemispheres show certain gross and many small asymmetries. The principal of the gross asymmetries are the differences in the limbic, temporo-sphenoidal, and occipital lobes. All these, as well as the minor peculiarities of the brain, will be described later.

Norma Superior.—Viewed from above, the cerebrum is distinctly hexagonal in its outline. The longest sides of the hexagon are the antero-lateral lines, upon which follow, in the order named, the anterior, the postero-lateral, and the posterior lines. The outline of the frontal lobes is quite angular.

The Norma Lateralis, or the outline of the cerebrum when looked at from the side, is obliquely quadrilateral. The antero-inferior line (base of the frontal with the antero-inferior boundary of the temporal lobes), and the postero-inferior boundary (base of temporal and occipital lobes), are nearly straight. The two superior lines, moderately convex, meet over the precuneus.

The right temporal lobe is perceptibly higher than the left.

There are a few specially prominent points on the external surface of each hemisphere: on the left such points are the supramarginal and the second temporal gyri; on the right, the supramarginal (somewhat less than on left), second temporal, and ascending parietal convolutions.

Norma Ventralis, or the outline of the base of the hemispheres, is oval, almost square anteriorly and tapering posteriorly. The basal surface of the frontal lobes slopes toward the middle and there is a marked elevation on each frontal lobe along the median fissure. These elevations are somewhat larger than those found ordinarily in the brains of whites. The olfactory nerves run along their middle. Each of the elevations comprises approximately two-sevenths of the base of each frontal lobe, and they, together with the sloping of the rest of the basal surfaces, impart to the inferior portion of the approximated frontal lobes a boat-keel-like appearance.

Norma Anterior.—The outline of the anterior lobes forms superiorly and laterally a regular arch, while inferiorly it consists of two shallow arches (concavities of the inferior surface of the frontal lobes), which meet over the median eminence. The outer terminal points of the arches are, as usual, situated higher than the inner ones.

The anterior surface of the frontal lobes is almost vertical.

Principal Measurements of the Cerebrum[1]

Length maximum of left hemisphere	18.0 cm.
Length maximum of right hemisphere	17.9 cm.
Width maximum of cerebrum	13.6 cm.[2]

As to the parts situated at the base of the cerebrum, nothing unusual was found. The anterior perforated spaces are not appreciably larger than in whites. The optic commissure is well formed; the optic nerves are strong. Hypophysis of ordinary size and appearance. Crura cerebri, cut at the niveau of the mesial border of the hippocampal gyri, are exactly equal in size. Their cross-section measures on each side 2.8 cm. in greatest length and 1.7 cm. in greatest width.

There were no marked anomalies in the cerebral circulation. The ventricles were not opened.

EXTERNAL CONFORMATION OF THE HEMISPHERES

PRINCIPAL SINUOSITIES. FISSURE OF SYLVIUS

The horizontal and ascending, or, more properly in this case, the anterior and posterior, branches of the *presylvian* begin separately, from the superior limiting sulcus of the insula on the right, and from a common fovea, connecting with that sulcus, on the left side.[3] The anterior branch is in line with, and appears like a continuation of, the anterior limiting sulcus of the insula.

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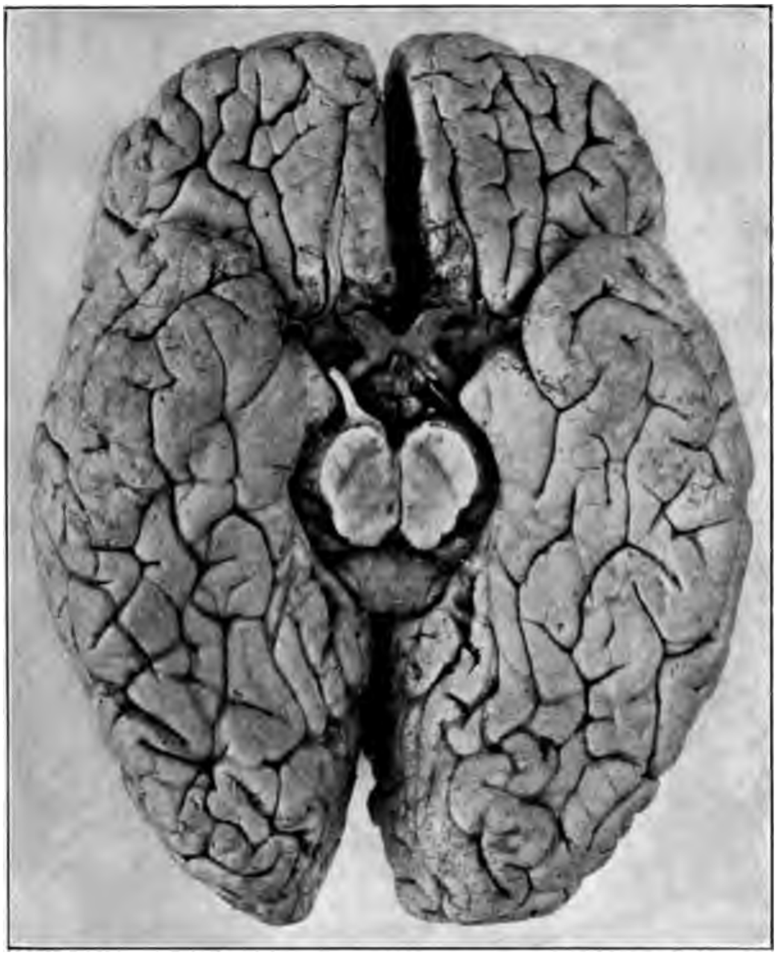
[1] For additional and comparative measurements, see the end of the paper.

[2] By an oversight this measure was given in the preliminary report as 14.2 cm., which was incorrect.

[3] This, according to Cunningham, is also frequently the case in whites. In 80 hemispheres examined by that author, two separate limbs of the presylvian were found 15 times (32.6 %) on the right and 15 times (44.1 %) on the left side.



KISHU'S CEREBRUM (BASAL ASPECT)

Length of the anterior branch, l., 2.8 cm., r., 2.6 cm.
Length of the posterior branch, l., 1.2 cm., r., 2.0 cm.

On the left the posterior branch is very short, and on both sides the anterior branch is the longer (the reverse of that generally found in white people).

The anterior branch connects on the right, over a submerged but not deep gyrus, with a descending branch from the inferior frontal sulcus.

The several important opercula situated along the lower border of the hemispheres in the neighborhood of these two anterior branches of the Sylvian, differ somewhat in size and form. (See the description of the inferior frontal gyrus.)

The stem or main limb of the Sylvian runs in a nearly straight line; it measures, from the anterior branch of the presylvian to the bifurcation, 6.5 cm. on the left and 5.2 cm. on the right hemisphere.[1]

The depth of the Sylvian fissure is considerable throughout. It measures:

	Left	*Right*
At the origin (x) of the anterior branches........	3.0 cm.	3.1 cm.
In middle between x and the precentral sulcus....	2.9 cm.	2.6 cm.
Opposite the precentral sulcus..................	2.8 cm.	2.7 cm.

The anterior branch of the presylvian measures at middle, left, 2.4 cm.; right, 2.2 cm. Of the terminal branches of the Sylvian, the superior measures, left, 2.6 cm.; right, 2.2 cm. The inferior measures, left, 1.8 cm.; right, about 0.8 cm. in depth.

The above figures show that, except at its beginning, the left Sylvian is the deeper at all points of measurement.

The main limb of the Sylvian presents the following points of interest on the two sides of the brain:

On the left, 0.5 cm. behind the posterior presylvian, there begins within the Sylvian, over a deep annectent loop, by means of the diagonal sulcus, a pronounced, long, composite, vertical furrow, which runs nearly parallel with the central fissure and the precentral sulci, and terminates above not far from the superior border of the hemisphere. The sulcus shows a number of medium deep and deep annectent fascicles.

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[1] The left fissure is longer than the right one in the whites, and the disproportion "is evident at all points of growth" (Cunningham, *Contr. to the Surf. Anat. of the Cerebr. Hemispheres*, 1892, p. 127; also Eberstaller).

On the right a similar furrow begins from the Sylvian, over a submerged loop, 0.6 cm. posteriorly to the hinder branch of the presylvian, and ascends in a quite straight line to within a few millimeters of the superior frontal sulcus. This furrow, in average as well as at maximum, is deeper than that on the left (maximum depth on the right, 1.7 cm.).

A little over 1.0 cm. posteriorly to the last mentioned furrow there begin from the Sylvian, on both sides, over a loop situated very deeply on the right and at medium depth on the left, the central fissures.

The base of the ascending frontal gyrus shows on each side a small trans-precentral, the base of the ascending parietal convolution a similar trans-postcentral sulcus. These sulci on the right side are entirely hidden in the Sylvian, but on the left side both reach to and slightly beyond the inferior border of the convolutions.

Finally, 0.5 cm. anterior to the bifurcation on the right and almost at it on the left, the Sylvian connects on each side, over a submerged but quite superficial gyrus, with the united postcentral sulcus.

The inferior lip of the Sylvian shows on the left the extremities of four, on the right of three, transtemporal depressions. One of these furrows on the left and one on the right effect a shallow communication with the superior temporal sulcus.

Of the terminal branches of the Sylvian the superior is 2.4 cm. in length on the left, and 2.6 cm. on the right side; they both end, as usual, in the supramarginal gyrus. The inferior ramus on the left runs 3.0 cm. horizontally and bifurcates; one of its branches, 2.5 cm. long, passes upward into the angular gyrus, while the other, 1.0 cm. long, descends backward. On the right the inferior terminal branch runs 1.5 cm. backward and downward and joins, over a deep gyrus, the first temporal sulcus.

The superior terminal branch on the left makes two connections: one, shallow, posteriorly, with a sulcus running downward and forward from the interparietal, and one, deeper, anteriorly, with a horizontal furrow running backward from the lower part of the postcentral sulcus. The inferior branch on the left connects, not far from the bifurcation, over a submerged annectent gyrus, with the posterior portion of the first temporal sulcus.

On the right side the superior terminal branch of the Sylvian fissure is better developed than the inferior, and is deeper than the latter. It ascends for 2.0 cm. into the supramarginal gyrus, running parallel to the central fissure, and ends in a short T. The lower terminal branch descends for 1.3 cm., over two medium deep anastomotic fascicles, and joins the ascending ramus of the first temporal sulcus.

Annectent Gyri.—On the left a strong column, at medium depth, between parietal and temporal lobes, at the beginning of the lower terminal branch of the Sylvian. On the right a similar but more superficial column, at the beginning of the inferior branch, and another more posteriorly in the same.

CENTRAL FISSURE

	Left	*Right*
Length (in a straight line, with sliding compass)........	9.0 cm. (50 % of the total length of the hemisphere)	8.6 cm. (48 %).[1]
Depth, maximum............	2.3 cm.	2.5 cm.

The fissure begins on both sides within the Sylvian, probably by means of the subcentral sulci of Eberstaller.[2] The origin of the central fissure is situated 0.6 cm. below the borders of the Sylvian on the left, and 1.5 cm. on the right It nearly connects on the right with the superior limiting sulcus of the insula. A short distance above the Sylvian border, the left central fissure shows a submerged, but not very deep, annectent gyrus; on the right there are two such fascicles in a similar location.

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[1] According to Schäfer (Quain's *Anat.*, 10th ed., III, 1, p. 143), "the length of the fissure in whites is about 2/5 (or 40 %) of the whole length of the hemisphere. It is relatively longer and more curved in the anthropoid apes than in man." (See additional measurements.)

[2] Cunningham (op. cit., 63) found a connection of the central and Sylvian in 19 % of hemispheres (of whites) · Benedict (*Anat. Studien an Verbrecher-Gehirnen*,

The form of the central fissure is quite tortuous, especially on the right. The left fissure, neglecting minor bends, is, from above downward and with reference to the frontal lobe, convex, concave, convex, concave, much convex, and nearly straight; that on the right, convex, concave, convex, concave, convex.

Each of the fissures sends a number of incisures into the adjacent convolutions. On the right, 3.3 cm. above the Sylvian, the central fissure connects, over a quite superficial annectent gyrus, with the postcentral sulcus.[1]

The two fissures show no submerged interruption.

The superior ends of the central fissures are situated almost opposite; distance from the same to the superior border, left, 0.5 cm.; right, 0.5 cm.[2]

Additional measures:

	Left	*Right*
(1) Origin of central fissure (on the lip of the Sylvian) to frontal pole[3]....................	7.3 cm.	6.5 cm.
(2) Superior extremity of central fissure to frontal pole..................................	10.9 cm.	10.8 cm.

Wien, 1872, p. 96) found a complete connection in 18 and an incomplete one in 6 of 38 hemispheres examined. Giacomini (*Varietà d. circonvoluzioni cerebrali dell' uomo*, Torino, 1882, cited by Cunningham) found such a connection only in 21 among 336 hemispheres. Retzius (*Das Menschengehirn*, 1896, I, p. 100) found the connection in 23 % of the hemispheres of Swedes.

[1] Retzius observed, on the brains of whites, anastomosis of the Rolandic fissure with the inferior postcentral sulcus in 9 %, with the superior in 3 % of the cases.

[2] Cunningham (op. cit., p. 162), in 52 hemispheres of white children and adults, found the following conditions in this respect: "(a) In 60 % the upper end of the fissure cut the upper border of the hemisphere and appeared on the inner surface; (b) in 21 % it just reached the upper border; and (c) in 19 % it fell short of the upper border."

[3] This and the following measures are the horizontal distances between vertical planes at the points mentioned.

	Left	*Right*
(3) Origin of central fissure to occipital pole....	10.7 cm.	11.4 cm.
(4) Superior extremity of central fissure to occipital pole...........................	7.1 cm.	7.1 cm.

Reduced to per cent. of the total antero-posterior diameters of the hemispheres, these distances are :

	Left	*Right*
(1)..	40.6 %	36.3 %
(2)..	60.6 %	60.4 %
(3)..	59.4 %	63.7 %
(4)..	39.4 %	39.6 %

PARIETO-OCCIPITAL FISSURE

The fissure appears on both sides like a direct and equally deep continuation of the calcarine stem. It runs on each side, in nearly a straight line, upward and slightly backward to, and on the left 2.1 cm., on the right 1.5 cm., over, the superior border of the hemisphere. The extremity forms on each side a small T, which is surrounded by a pronounced paroccipital gyrus.

The average depth of the fissure is 2.3 cm. on the left and 2.3 cm. on the right side; its length, from its junction with the calcarine stem to the superior border is on the left 4.0 cm., on the right 4.2 cm.

The fissure on the left connects over a submerged but quite superficial gyrus with the sub-precuneal sulcus, while that on the right shows a slightly deeper connection with a sulcus from the cuneus.

There are only a few very deep annectent bundles within each fissure.

CALCARINE STEM AND SULCUS

The stem is simple, its course on each side slightly wavy. Its length is 2.6 cm. on the left, 3.3 cm. on the right; its average depth on both sides about 1.5 cm.; at its junction with the parieto-occipital it equals the latter in depth.

Both calcarine sulci communicate with the stem over a submerged but not very deep gyrus. The left sulcus is nearly straight; the right one describes anteriorly a moderate curve. The sulcus on the left is free from connections and gives off but two small incisures; that on the right connects superficially with a cuneal sulcus and sends from its curve a deep branch, 1.0 cm. long, downward to the basi-mesial border.

The calcarine sulcus extends on both sides to the dorsal surface of the occipital lobe, and terminates in a small bifurcation. The most distal point is on the left 1.55 cm., on the right 1.3 cm., in a straight line beyond the border of the hemisphere.

The length of the calcarine sulcus from its junction with the stem to the border of the occipital lobe is 4.6 cm. on the left, 4.8 cm. on the right side. It is on both sides much shallower than the stem.

There are a number of connecting fasciculi within the two calcarine stems and sulci. On the left there is a deep bundle in about the middle of the stem and reaching from the base of the stem to the point of the cuneus; there are also two bundles at medium depth behind the junction of the stem and the sulcus and passing from the gyrus lingualis to the cuneus; and there is another fascicle of medium depth in the sulcus, about 2 cm. from the occipital border. On the right side we find similar annectent gyri in similar locations, but the bundle in the stem passes downward to the bottom and does not visibly reach the cuneus.

COLLATERAL FISSURE

This furrow is of considerable extent, particularly on the right. Its total length, in a straight line, is 8.15 cm. on the left, and 11.3 cm. on the right.

The anterior termination of the fissure is on both sides free and simple; it is distant from the pole of the temporal lobe on the left 5.7 cm., on the right 2.9 cm.

On both sides, nearly in the line of continuation of the collateral fissure and incising the antero-mesial border of the temporal lobe, is found a well-developed fissura rhinica. This furrow is particularly marked on the left side where the collateral is shorter.

Posteriorly, the left collateral fissure terminates in a line about 3 mm. from the border of the hemisphere, while on the right it reaches the border. Both of the fissures connect, each by a shallow sulcus, with the third temporal.

Each collateral gives off several incisures. In the posterior half of both fissures are found, at medium depth, annectent bundles which pass between the fusiform and lingual lobules.

CALLOSO-MARGINAL FISSURE

The gyration on the mesial surface of this brain presents several very interesting modifications. The calloso-marginal is duplicated on the left and almost triplicated on the right side. The main fissure is on both sides throughout continuous and connects freely and deeply with the paracentral. It is on both sides doubled by a pronounced mesial frontal sulcus. This is deep and continuous on the left, more shallow and interrupted by an isthmus on the right. In addition the right callosal gyrus is traversed along its entire superior extent by a shallow, interrupted sulcus, which runs parallel with the calloso-marginal fissure and separates the surface of the callosal into two nearly equal superior and inferior portions.

The left calloso marginal begins in a simple way below the genu of the callosum ; the right proceeds from a subrostral sulcus which curves about a lobule on the posterior extremity of the mesial portion of the frontal lobe.

During its course, each of the calloso-marginal fissures gives off a few small branches or incisures. On the left, as well as on the right, four such small branches indent the superimposed part of the superior frontal gyrus.

There is on both sides a well-developed rostral, and on the right also a transverse subrostral sulcus ; there is also a fair representation on each side of the postlimbic sulcus.

The paracentral sulci are well curved and both end on the dorsal surface of the hemisphere: the left in a line, 1.5 cm. from the median border and 0.7 cm. behind the superior extremity of the central fissure; the right in a T, with the posterior branch much shorter than the anterior, 1.6 cm. from the median border of the hemisphere and 0.5 cm. behind the terminus of the central fissure.

The average depth of the calloso-marginal is 1.0 cm. on the left, 1.3 cm. on the right; that of the paracentral 1.5 cm. on the left and 1.8 cm. on the right side.

Annectent Gyri.—There are in the calloso-marginal five or six deep bundles on the left and seven or eight such bundles on the right, passing between the callosal gyrus, the superior frontal convolution, and the paracentral lobule.

MINOR FISSURES OR SULCI

Frontal Lobe.—The *superior frontal sulcus* on the left is a continuous furrow, which runs, in a tortuous way, from the anterior portion of the orbital surface to within a few millimeters of the superior precentral sulcus. On the right a similar but somewhat less tortuous furrow extends from the orbital border of the frontal lobe to the superior precentral sulcus, connecting with the same.

Each of the sulci sends off a number of transverse branches and incisures. That on the left communicates with the medial frontal sulcus of Eberstaller and with the vertical furrow anterior to the precentral sulci; that on the right connects with the medial frontal and the superior precentral sulcus.

The depth of each of the superior frontal sulci averages about 1.5 cm., the maximum depth measured being 2.8 cm. (on the left).

Mesially from the superior frontal sulci we find on each side of the brain, but particularly on the left, small segments of Cunningham's mesial sulcus.

The *medial frontal sulci* of Eberstaller are only fairly well represented.

The *inferior frontal sulcus* can be isolated with more facility on the left than on the right hemisphere; it does not connect on either side with the inferior precentral sulcus.

The left inferior frontal sulcus is in two portions; it begins posteriorly 3 mm. in front of the middle of the inferior precentral, intersects the anomalous vertical furrow, and terminates about 2 cm. in front of this furrow in a shallow Y. A few millimeters inferiorly and posteriorly to the lower terminal branch of this Y begins the second portion of the sulcus. This portion consists mainly of the sulcus radiatus, and sends six branches into the adjacent convolutions.

On the right side, that part of the vertical furrow which corresponds to the diagonal sulcus connects, 1.9 cm. above the Sylvian, with a short but deep T branch, 1.0 cm. long, which runs directly forward and probably represents the posterior extremity of the inferior frontal sulcus. The anterior portion of the same consists of the sulcus radiatus, possibly joined with the frontomarginal sulcus. This portion, as on the left, shows six branches. One of these connects inferiorly with the anterior branch of the presylvian; another ascends to within a short distance of the median frontal sulcus.

A small independent depression indents on each side the surface of the pars triangularis of the inferior frontal gyrus.

All the frontal sulci show numerous submerged annectent gyri.

The *anomalous vertical furrow* which runs on each side anterior to and nearly parallel with the precentral sulci, has been referred to in the description of the Sylvian.

The *precentral sulcus* consists on each side of two independent, radiating segments of considerable depth. On the left these segments are isolated; on the right the superior connects, over a deep annectent bundle, with the first frontal sulcus, while the inferior joins and probably forms the superior part of the anomalous vertical furrow.

Above the superior precentral there is on each side an independent, triradiate sulcus extending to the upper border of the hemisphere and bounding laterally the ascending frontal convolution ; it looks like a third part of the precentral.

Orbital Surface.—The *Sulcus Olfactorius* presents a typical conformation. It is a long depression, running from 1.0 cm. at base to 0.5 cm. at terminus laterally to the median fissure, quite deep, terminating on the left side in a free line and on the right side in a small Y. Slightly anteriorly to the end a small transverse sulcus crosses the border of the hemisphere on the left, and a small semicircular sulcus indents the border on the right side. The parts of the first frontal gyrus traversed by the olfactory sulcus are, as previously stated, quite prominent.

Besides the olfactory, each of the orbital parts shows two other antero-posterior sulci. One of these, the outer, is apparently the orbital sulcus. Its form on the left is that of a Y, or of a K with the lower branch interrupted, while on the right side it forms a somewhat crooked X.

Both of these figures are situated somewhat more externally than is usual, and between them and the olfactory furrows we find on each side a distinct separate sulcus. On the left this sulcus consists of two branches and indents the first frontal convolution. The anterior branch communicates with the main ramus of the orbital sulcus. On the right side the sulcus begins near the root of the olfactory nerve and then passes forward, bounding the first frontal gyrus.

The transverse orbital sulci present nothing extraordinary.

Parietal Lobe.—The *postcentral sulcus* shows neither on the left nor on the right any superficial interruption.[1] It connects on both sides with the Sylvian and on the left side also with the interparietal sulcus.

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[1] According to Cunningham, in the brains of adult Irishmen the postcentral sulcus was found complete and separated from the interparietal sulcus (as on the right in the Eskimo brain) in 11 %; it was found complete and communicating with the interparietal (as on the left in the Eskimo brain) in 60 % of the hemispheres.

The left postcentral is very long, reaching to within 0.5 cm. of the superior border of the hemisphere, where it connects, over an imperfectly submerged gyrus, with a vertical sulcus from the precuneus.

The connection of the postcentrals with the Sylvian is not effected by the trans-postcentral sulci.

The course of both postcentral sulci, and particularly of that on the left, is tortuous.

Each sulcus gives off during its course several incisures and small branches. On the left side, 1.4 cm. above the Sylvian border, a quite deep branch passes backward through the supramarginal convolution and communicates with the superior terminal branch of the Sylvian. Three cm. above the Sylvian the left postcentral connects, over a submerged gyrus, with the interparietal sulcus. Opposite this junction a branch, 1.4 cm. long and looking like the anterior terminus of the interparietal, passes forward and slightly upward into the ascending parietal gyrus.

In its upper third the left retrocentral sulcus gives off three smaller branches. The lowest one of these passes backward; the middle one indents the ascending parietal gyrus and ends near the central sulcus; the third branch passes upward, ending in front of the dorsal termination of the paracentral fissure. The main limb of the sulcus then bends backward and runs toward the aforementioned connection with the precuneal.

The right postcentral sends off four branches or incisures, one of which, 2.0 cm. long, passes backward from near the middle of the sulcus. Two and a half cm. above the Sylvian the right postcentral connects, over a submerged but not deep fascicle, with the central fissure.

Superiorly the sulcus divides into two branches, the anterior 1.4 cm., the posterior 2.4 cm. in length, which surround, in the form of a broad Y, the extremity of the paracentral sulcus.

Each postcentral shows in its course a number of more or less deep annectent fascicles.

The trans-postcentrals are in their usual position, but only that on the left (as was the case with the trans-precentrals) reaches the dorsal surface of the hemisphere.

The *interparietal sulcus* on the left commences, with a small T, somewhat inferiorly and anteriorly to the end of the superior terminal Sylvian, 1.8 cm. from the Sylvian bifurcation. Seven millimeters above its beginning the sulcus connects, over a submerged but not deep gyrus, with the postcentral. From this point the interparietal runs in a slight curve 4.2 cm. upward and backward and joins freely the paroccipital sulcus. The interparietal gives off three larger branches, one of which runs downward, into the supramarginal, and the other two upward, into the superior parietal gyrus. There are within the sulcus several deep but no interrupting connecting bundles.

On the right side we find an anomalous deep furrow, uninterrupted except by very deep bundles, running from a point well down between the supramarginal and angular gyri, in a wavy course, parallel in the main with that of the postcentral sulcus and central fissure, to and 1.0 cm. over the superior border of the hemisphere, ending on the precuneus.

From this furrow, above its middle, begins, over a depressed but still partly visible gyrus, the horizontal part of the interparietal. This is angular, but 0.8 cm. long (in a straight line), and connects with the paroccipital.

The vertical furrow separates a stout and prominent convolution which runs parallel with the ascending frontal and ascending parietal gyri. The superior portion of the vertical furrow lies, independent of both, between the postcentral and the anterior curve of the paroccipital sulcus.

The minor parietal sulci will be mentioned with the description of the convolutions.

Occipital Lobe.—The *anterior* as well as the *lateral occipital*

sulcus is fairly well represented on both sides. The anterior sulcus on the left connects with the ascending branch of the superior temporal, the anterior and lateral furrows on the right with the anomalous *medio-temporal* sulcus (q. v.). The lateral sulcus on the left is in the form of an H and is without connections.

Temporal Lobe.—The sulci on the superior or intrasylvian surface of the lobe have been mentioned.

The lateral surface is higher on the right than on the left side. Its sulci are on both sides deep and the gyrations distinct.

The *superior or first temporal sulcus* begins on both sides in a line near the pole of the temporal lobe. It is preceded on the left by a small transverse furrow, on the right by a shallow depression.

The horizontal portion of the superior temporal is continuous on both sides. Its form is wavy on the left, more straight on the right side. It terminates on the left in a line 1.8 cm. posteriorly to the Sylvian bifurcation and within 0.3 cm. of the inferior terminal Sylvian. The ascending portion is separate. On the right the horizontal portion runs to a point about 1.2 cm. posterior to the Sylvian bifurcation, connects with the inferior terminal Sylvian, and proceeds without interruption backward and upward as the ascending ramus.

The horizontal portion on the left connects, 1.6 cm. before its posterior end, over a submerged but not deep gyrus, with a parallel, *medio-temporal*[1] sulcus, 4.4 cm. long, which separates the posterior half of the middle temporal gyrus into an inferior and a superior portion. The horizontal branch on the right connects, by means of a shallow transverse sulcus, with the second temporal, and more posteriorly as well as quite superficially with the *medio-temporal.*

The ascending branch on the left begins with a short vertical part that connects with the inferior terminal Sylvian. It runs backward and slightly upward, almost in line with the horizontal portion. It connects with the ascending part of the second temporal, and finally joins the anterior occipital sulcus.

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[1] This term suggests itself from some similarity of this to the medio-frontal sulcus of Eberstaller.

On the right the ascending branch runs in an angular manner upward and backward, terminating a short distance below the paroccipital. This branch also has a shallow connection with the *medio-temporal.*

The *medio-temporal* sulcus is even better marked on the right than on the left. Beginning somewhat posteriorly to a vertical from the Sylvian bifurcation, it runs backward and upward, parallel with the ascending portion of the first temporal, to the occipital lobe. It connects with both the horizontal and ascending portions of the first temporal and also with the anterior as well as with the lateral occipital sulci.

Both the first and the *medio-temporal* sulci send off shorter branches and all show deep connections passing between the adjacent gyri.

The mean depth of the horizontal ramus of the left superior temporal sulcus is 1.8 cm., that of the right, 2.1 cm. The ascending rami are not so deep. The depth of the *medio-temporals* is less than that of the horizontal, but slightly greater than that of the ascending portion of the first temporal sulci.

The *second* or *middle temporal* sulcus is composed on each side of two separate segments; each of these shows some secondary ramifications.

The anterior portion on the left commences with a curve, passes in a wider curve backward and slightly upward, and terminates, nearly vertically below the central fissure, with several marked radiations. The posterior left segment begins in a Y slightly above and posteriorly to the termination of the first part, and runs slightly downward and backward, to and along the inferior border of the hemisphere, terminating in a simple manner about 1.6 cm., in a straight line, from the occipital pole, under the lateral occipital sulcus. Two and seven-tenths of a cm. anteriorly to its end this segment gives off, over a deep annectent fascicle, an ascending portion, which runs with several bends directly upward to connect with the ascending part of the first temporal sulcus.

On the right side, the first portion of the second temporal has its simple beginning 1.0 cm. in a straight line from the pole of the temporal lobe; it passes 4.6 cm. backward and ends in a small bifurcation. A short distance anteriorly to this bifurcation the sulcus communicates with the first temporal.

The posterior segment on the right begins a little posteriorly to the bifurcation of the first part, in the form of a doubly curved, nearly transverse line. This line bends, runs backward and downward, reaches the inferior border, sends a 1.3 cm. long branch backward and inward into the third temporal gyrus, passes again to the dorsal surface of the hemisphere, and ends in a long Y figure, the lower extremity of which reaches to below the lateral occipital sulcus.

The *third* or *basitemporal sulcus* is unusually well developed, particularly on the left side.

The sulcus on the left is continuous, somewhat wavy in form, and measures 9.3 cm. in length (in a straight line). It effects a shallow connection with the collateral.

The right sulcus consists of three large separate segments, which extend from near the pole of the temporal lobe to within 1.7 cm. of the occipital pole. The segments send off a number of radiating branches, and the posterior one connects with the collateral.

On both sides the third temporal sulcus contains a number of submerged, more or less deep, annectent fascicles.

THE INSULA

The conformation of the surface of the island is quite similar on the two sides of the brain (figs. 57, 58).

The marginal or limiting sulci of the insula are very deep, especially anteriorly, and they are continuous, except over the antero-inferior extremity or pole of the insula.

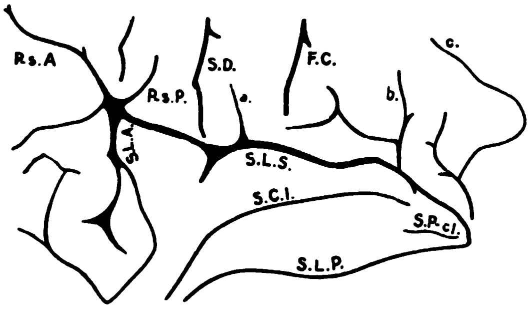

FIG. 57—Left insula. S.L.S., S.L.A., S.L.P., Sulci limitantes insulæ, superior, anterior, posterior; S.C.I., Sulcus centralis insulæ; S.P-c. I., Sulcus post-centralis insulæ.

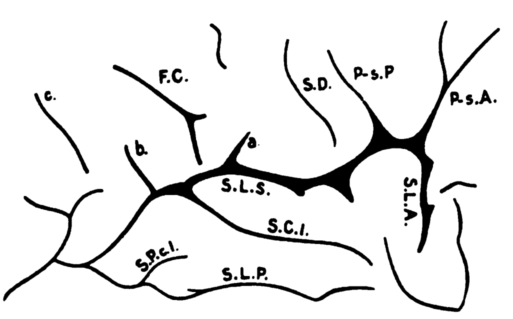

FIG. 58—Right insula. P-s.A., Presylvian anterior; P-s.P., Presylvian posterior; S.D., Sulcus diagonalis; a, Trans-precentral sulcus; F.C., Central fissure; b, Trans-postcentral sulcus; c, Postcentral sulcus.

The superior limiting sulcus communicates on both sides with the two branches of the presylvian; it also gives off on each side two short branches upward, and a deep short incisure downward, into the insula itself. The average depth of the superior limiting sulci is 2.8 cm., and in the course of each there are several strong annectent fascicles passing between the lobes of the island and the overlying opercula.

At the posterior inferior angle of the insula there are two strong, almost superficial annectent bundles, connecting the superior temporal gyrus with the insula; there is on each side also a strong connecting bundle between the anterior extremity of the posterior lobe of the insula and the superior temporal convolution.

The central sulcus of the insula is independent on the left, but it communicates with the superior limiting sulcus on the right side. The central sulci average only 0.5 cm. in depth, and each shows anteriorly a submerged anastomotic fascicle.

Besides the above sulci, each insula shows a small furrow which divides its posterior lobe into superior and inferior portions (sulci retrocentrales insulæ). There is also on each side a curving but not very deep sulcus which passes from below over the pole of the insula. This sulcus ends freely on the anterior lobule of the insula on the right, but joins the anterior limiting sulcus on the left side.

The anterior and posterior lobes of the insula are well defined and show the ordinary planes. Gyri breves fairly well marked.

CONVOLUTIONS

Frontal Lobe. Dorsal Surface.—The frontal gyri are rather more complex and tortuous than in average whites. The dorsal portion of the left *superior frontal gyrus* is slightly narrower in front than that of the right (left 2.85 cm., right 3.05 cm.), but somewhat broader posteriorly (left 2.8 cm., right 2.5 cm.). In about the middle, the left gyrus sends downward a prominent, shoe-like convolution, which indents the middle frontal gyrus. The dorsal parts of both superior frontal convolutions show, besides the segments of the sulcus mesialis of Cunningham, a considerable number of transverse depressions.

The *middle* or *second frontal gyrus* is on both sides of an irregular form and partly subdivided by the medial frontal sulcus. The posterior portion of the convolution on the left is especially well developed, and is separated from the more anterior portion by the vertical furrow. Both middle frontal gyri have numerous superficial and deep connections with the neighboring convolutions.

The *inferior* or *third frontal gyrus* is in this brain, contrary to the general rule, more extended antero-posteriorly and more redundant on the right than on the left side. This excess is especially marked in the right middle or triangular part (cap of Broca).

The convolution shows numerous connections; the orbital and triangular parts connect on both sides superficially with the middle frontal gyrus.

The *ascending frontal* convolution is somewhat stronger on the right than on the left. It is on both sides most slender in its middle fourth. It is on both sides continuous from the Sylvian fissure to the superior border of the hemisphere. Superficial connections.—On the left: a broad isthmus to the inferior frontal; a superficial annectent gyrus to the middle frontal; similar gyrus to superior frontal; and, at the median border of the hemisphere, three superficial annectent gyri, one to the superior frontal, one to the paracentral, and one to the ascending parietal convolutions. On the right there is a broad superficial connection with the pars basilaris of the inferior frontal; and similar connections anteriorly with the middle and superior frontal, and superiorly with the paracentral and ascending parietal gyri.

Mesial Surface.— The *left marginal gyrus* is considerably higher than the right one. Its height is, from the orbital surface to the calloso-marginal fissure, on the left 2.2 cm., on the right 1.8 cm.; opposite the anterior pole, on the left 3.2 cm., on the right 2.5 cm.; and the average height of the upper part is, on the left 2.6 cm., on the right 2.3 cm. On both sides the marginal and the calloso-marginal gyri stand to each other, as to size, in an inverse relation.

The inferior extremity of each marginal gyrus is marked by the sulcus rostralis transversus and connects almost superficially with the inferior extremity of the limbic lobe (carrefour olfactif of Broca). The posterior extremity of the marginal gyrus communicates on the left by two superficial, on the right by one superficial and one deep, annectent gyri with the paracentral lobule.

As to the convolutions on the orbital surface of the frontal lobes, on the left the first and third frontal gyri, both markedly developed, join a little posterior to the middle of the surface, and the second frontal gyrus forms a wedge anteriorly between them. On the right, the second passes between the first and third gyri as a narrow band to the root of the olfactory nerve, where it joins the extremities of the other frontal convolutions.

The olfactory tracts and bulbs show nothing unusual.

The Parietal Lobe.—The *ascending parietal gyrus* is somewhat more voluminous on the left hemisphere (average width on the left about 1.2 cm., on the right about 1.0 cm.). The base of the convolution on the left measures, antero-posteriorly, 3.2 cm., of that on the right 1.9 cm. Both gyri show a constriction between their lower and middle thirds, and a marked development of the latter portion. The upper third is on each side slender, tapering, and not raised fully to the niveau of the neighboring parts.

The upper extremity of the gyrus connects superficially with the ascending frontal, paracentral, and superior parietal convolutions; the lower part connects, by means of submerged but not deep fascicles, with the ascending frontal and supramarginal gyri.

The *superior parietal gyrus* is throughout somewhat larger on the left side. Anteriorly it communicates on both sides superficially with the ascending parietal, and in a similar way posteriorly with the superior occipital convolution. Inferiorly there are numerous submerged fascicles of connection between the superior and inferior parietal gyri.

The left superior parietal convolution is separated by transverse sulci into two parts, the middle of which is very redundant. The right gyrus is somewhat similarly divided into two portions, of which the anterior is the more redundant.

The convolution shows on each side a number of lateral and surface indentures.

The *paroccipital gyrus* forms on each side a well-marked loop, which surrounds the extremity of the parieto-occipital fissure. The left gyrus is larger than the right one.

The *inferior parietal convolution* as a whole is larger on the right, compensating for the smaller size, on that side, of the superior parietal.

The *supramarginal gyrus* is fairly well defined on the left and is divided from the angular gyrus by a vertical branch proceeding from the interparietal sulcus (the sulcus intermedius primus, Jensen, Eberstaller). On the right side the marginal convolution is larger and more redundant; its operculum, or the triangular part between the two terminal branches of the Sylvian fissure, is especially well developed. The gyrus is bounded posteriorly by the inferior extremity of the vertical parietal sulcus.

The *angular* and *postparietal gyri* are nicely differentiated loops, separated by a vertical depression (sulcus intermedius secundus, Eberstaller) on the left, but are of irregular form and separated only from below by the extremity of the ascending branch of the superior temporal sulcus on the right side.

All the parts of the inferior parietal convolutions show minor lateral or surface indentations, and numerous deep as well as superficial connections.

The *paracentral lobule* is much better isolated anteriorly on the left than on the right. The left lobule is also slightly more redundant, though slightly less high and not any longer than that on the right side.

The surface of the left lobule is indented by two Y-shaped and one lineal, that of the right by one Y-shaped and two lineal, sulci.

Precuneus.—This lobule is separated completely on the left, incompletely on the right, from the limbic gyrus, by the posterior limbic or subprecuneal sulcus. The surface of the left precuneus is indented by four vertical sulci, two of which connect with the posterior limbic, while the other two pass over the border of the hemisphere, where the anterior communicates with the posterior terminal branch of the postcentral sulcus, and the posterior one forms the anterior boundary of the paroccipital gyrus. On the right, the precuneus presents a Y-shaped sulcus in connection with the intralimbic and postlimbic sulci, while its superior portion is indented by the terminus of the anomalous vertical parietal sulcus.

Both the paracentral lobule and the precuneus show numerous deep, besides the superficial, connections with the adjacent gyri.

Occipital Lobe.—The lobe measures, from the antero-inferior extremity of the cuneus to the occipital pole, on the left 4.7 cm., on the right 4.9 cm., which is respectively 26.1 % and 27.4 % of the whole length of the hemisphere (see also additional measures).

The gyration of the lobe in the Eskimo brain under consideration is not inferior to that met ordinarily in whites. It presents, as is often the case, some difficulty to analysis, but no very extraordinary features.

The *cuneus* is bounded by almost straight lines. It is lower, but longer, on the right hemisphere. Its superior border is indented on the left by two, on the right by one incisure. Its surface shows on the left an independent triradiate sulcus with branching extremities; on the right a large, somewhat Y-shaped sagittal sulcus, which connects with the parieto-occipital, and a quadriradiate sulcus, one of whose branches connects with the collateral.

Temporal Lobe.—The *superior temporal gyrus* is considerably stronger on the right than on the left side (mean height of the left, 0.8 cm.; of the right, 1.1 cm.). The left gyrus is particularly slender and is slightly depressed in its middle.

The left convolution is interrupted by one of the transtemporal furrows which connects with the superior temporal sulcus.

The right superior temporal gyrus appears to be composed of three imperfectly separated portions, namely, a long anterior part, reaching to within 1.0 cm. of the bifurcation of the Sylvian, separated from the rest of the gyrus by two incisures (one superior and one inferior), which almost meet, and a shallow depression. The more anterior of the following two parts is in the form of a larger oblong lobule, situated between the depression just mentioned and the connection of the inferior terminal Sylvian with the superior temporal sulcus. The third part is a small, partly depressed isle projecting from the second part into the Sylvian and separated from that part by a shallow sulcus.

The *middle* or *second temporal gyrus* is also more voluminous on the right side; both are quite redundant.

The anterior half of the convolution on the left is curved, on the right straight and wedge-shaped. The posterior half on each side, somewhat less redundant, is divided into two parallel, nearly equally strong portions by the secondary *medio-temporal sulcus*.

The anterior portion of the right gyrus is indented by two vertical sulci proceeding from the second temporal; the anterior of these connects with, while the posterior reaches very near to, the first temporal sulcus.

The superior posterior portion of the right gyrus is separated by a connecting branch between the first and medio-temporal sulci.

Both gyri show a number of more or less marked lateral incisures and a few minor surface furrows.

The inferior or *third temporal gyrus* lies, on both sides of this Eskimo brain, almost wholly on the inferior surface of the temporal lobe. It is easily isolated.

The gyrus is on both sides strongest in about its middle third, its anterior and posterior extremities tapering a little. It is on each side incised by a number of incisures which pass into it from both the second and third temporal sulci, but it is nowhere totally interrupted. In its middle enlargement the gyrus is on each side indented by an independent ramifying sulcus, which on the left has the form of a double joined Y, and on the right approaches the form of H. Excepting the anterior and posterior, the gyrus has one superficial connection on the left (with the anterior portion of the second temporal) and two on the right side (with the anterior part of the second temporal and with the fusiform lobule).

The *fusiform gyrus*, well defined on both sides, is throughout more voluminous on the right. The left gyrus shows, near its posterior third, a shallow interruption. The borders of both convolutions are indented by a number of more or less pronounced incisures. The gyri show numerous submerged connections with the third temporal and the lingual convolutions.

The *lingual gyrus*, well defined, connects on both sides, anteriorly, superficially, and freely, with the gyrus hippocampi ; posteriorly, near the occipital pole, with the fusiform lobules.

The gyrus is partly divided on both sides into halves by a branch from the collateral fissure. The anterior portions are somewhat tongue- or pear-shaped, the tapering ends connecting with the hippocampal gyri, and each is indented by a quite prominent sagittal sulcus. The posterior extremity of this sulcus, on the right, connects with a branch from the collateral. The posterior half on the left is nearly straight and more slender than the anterior one ; that on the right forms a marked loop. The surface of the posterior portions, also, is indented on each side by a small, mainly sagittal depression.

THE LIMBIC LOBE

This lobe differs remarkably on the two sides. It is much larger over almost its entire extent on the right side, as will be indicated by the following measures (taken between the sulcus of the callosum and the external boundary of the gyrus):

	Left	*Right*
Antero-inferiorly, below the rostrum (above Broca's carrefour olfactif)	0.3 cm.	0.5 cm.
Anteriorly (horizontally)	0.5 cm.	1.0 cm.
Superiorly, beneath the first frontal or marginal gyrus	0.85 cm.	1.5 cm.
Superiorly, below the paracentral lobule	1.5 cm.	2.1 cm.
Superiorly, below the precuneus	2.0 cm.	2.6 cm.
Posteriorly, opposite the cuneus	1.6 cm.	1.4 cm.

The lobe begins on both sides at the well-developed olfactory lobule or space of Broca, below the rostrum of the callosum. Its ascending portion and a part of its horizontal portion are entirely smooth on the left; on the right side the external boundary of these parts shows many depressions, and the horizontal part is traversed by the previously described sagittally running, shallow sulcus.

All the parts of the limbic lobe behind the line which bounds anteriorly the paracentral lobule are much more developed than the parts anterior to this line. On the left this posterior portion of the lobe is traversed by a number of transverse sulci and has the appearance of being composed of four or five loops lying in close apposition. On the right, there is a somewhat similar formation of loops, but their outline is more angular. Directly beneath the splenium both lobes become very narrow and soon after blend with the hippocampal convolutions.

Deep bundles connect the limbic lobe on each side with the mesial part of the first frontal gyrus and the parietal lobule. The connections of the lobe with the precuneus are on the left all submerged, though not deep, while on the right side besides these deep bundles there is also, posteriorly, a superficial annectent gyrus between the two structures. A few deep fascicles pass between the lobe and the cuneus and lingual gyrus.

HIPPOCAMPAL GYRUS

This gyrus is somewhat larger on the right side. It is almost isolated externally on the right, only a small annectent gyrus passing from it, between the fissura rhinica and the inferior temporal sulcus, to join the fusiform convolution. On the left side this connection is broader. The surface of the gyri is smooth. Both gyri connect superficially with the lingual convolutions. The *uncus* is well marked on both sides.

The parts within the limbic lobe show nothing extraordinary. The callosum is exceptionally strong and very nearly equal on the two sides. Its measurements are as follows:

Diameter antero-posterior maximum	7.9 cm.
Maximum height of anterior enlargement	1.45 cm.
Maximum height of posterior enlargement	1.5 cm.
Maximum height between the enlargements	1.0 cm.
Minimum height between the enlargements	0.75 cm.

The dentate gyrus is well differentiated and the fimbria well developed.

CEREBELLUM, PONS, MEDULLA

All these parts appear to be very well developed; they are symmetrical and present no gross deviation from the shape and conformation of the same parts as generally observed in whites.

Measurements of Cerebellum

Height maximum	5.7 cm.
(in fresh brain	5.8 cm.)
Diameter antero-posterior maximum[1]	6.8 cm.
(in fresh brain	7.0 cm.)
Width maximum[2]	10.4 cm.
(in fresh brain	10.6 cm.)
Antero-posterior length of worm	4.3 cm.
Maximum height of worm	4.0 cm.
Maximum depth of anterior fossa	2.2 cm.
Maximum depth of posterior incisure	1.3 cm.
Depth to the top of the worm (from a plane corresponding to the highest points on each cerebellar hemisphere)	1.3 cm.

Measurements of the Pons

Width maximum	3.5 cm.
Height (vertical) from fourth ventricle	2.9 cm.
Length (antero-posterior)	2.5 cm.

Measurements of the Medulla

Thickness maximum infero-superiorly	1.8 cm.
Thickness maximum laterally	2.0 cm.

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[1] About 1.0 cm. from the median line on each side.

[2] At about the junction of anterior third with posterior two thirds.

THE CEREBELLUM

The great horizontal fissure encircles the organ completely. It averages 1.6 cm. in depth. On its bottom many slender rods are seen to pass from one part of the cerebellum (superior) to the other (inferior), all directed obliquely outward. (There are similar rods within all the other sulci.)

All the usual lobes of the upper surface (as well as all the divisions of the worm) are present and well developed. There are two lobules situated laterally to the lingula (which faces forward); these two lobules are joined 2 cm. outward to the alæ lobuli centralis. These last are very small and hidden. The lingula, with the wings and the central lobule, gives a very good appearance of a moth, with wings converging upward.

Central lobe small. Folium cacuminis double; uvula consists of eight segments of which the last two (in pyramid) are small.

The pyramid is breast-shaped, with the apex posteriorly and a deep notch anteriorly; into this notch are received the last two little segments of the uvula. The lateral masses are anteriorly separated and form two distinct parts, applied over the extremity of the uvula. The parts connect anteriorly by deep annectent fascicles with the cerebellum. Tuber portions small. None of the lobes and parts of the lower surface and lower worm present anything extraordinary.

SUMMARY OF THE MAIN PECULIARITIES OF KISHU'S BRAIN

As a whole, this Eskimo brain is heavier and larger than the average brain of white men of similar stature. The excess of weight over the averages of both Broca's and Manouvrier's specimens (averages which agree well with those obtained by Bischoff, Boyd, Sims, Huschke, and other observers) amounts to almost 150 grammes.

As to size, the average antero-posterior diameter of the white male brain ranges, according to Huschke, between 16.0 and 17.0

cm. (mean 16.5 cm.), and the average maximumlateral diameter 14.0 cm. The mean of these measures, which largely removes the disturbing element of the shape of the brain, is 15.25. The crude measurements of Kishu's brain amount, for the length, to 18.0 cm. for the left and 17.9 cm. for the right hemisphere, and 13.6 cm. for the maximum breadth of the cerebrum. These figures give us the mean of 16.5, which is to that in whites as 108.2 to 100.

The different parts of the brain do not show the same *relative* weight proportions as they do in the average white brain, and the same is true of the relative size of the principal parts of the cerebrum. The cerebellum, and particularly the pons with the bulb, is relatively somewhat heavier in Kishu than in whites; while as to the main cerebral parts the most remarkable feature is the relative smallness of the parietal portion (see additional measurements).

In its external conformation this Eskimo cerebrum rather exceeds that of an average white male in the number, extent, and depth of the sulci, and in the complexity of the gyrations.

Both hemispheres, and especially the right one, show a generally marked tendency to vertical gyration. The left side shows one, the right two, large, anomalous, composite, vertical furrows. The gyration of the left hemisphere is in general somewhat more complex than that of the right one.

The pars triangularis of the inferior frontal convolution, the temporal lobe, inferior parietal gyrus, and limbic lobe are all larger on the right than on the left; on the other hand, the mesial part of the superior frontal gyrus, the middle frontal gyrus, the paracentral lobule, the precuneus, and the mass of the occipital lobe, are larger on the left than on the right side.

There is a great length of the postcentral sulci, particularly of that on the left. The left Sylvian (main limb) is longer, the left central fissure is situated (in a horizontal direction) slightly more posteriorly and is slightly more vertical than the right. There is a bilateral, longitudinal division of the mesial part of the superior frontal gyrus and a tendency on the right to a similar division of the limbic lobe ; and on each side there is a pronounced mediotemporal sulcus, dividing sagittally the posterior part of the middle temporal convolution.

Besides those enumerated, there are many other interesting minor features of the brain which need not be repeated.

COMPARATIVE NOTES

The collection in the Medical Department of Columbia University includes, besides that of Kishu, the brains of three other Eskimo of the same party and originally from the same locality (Smith sound). One of these specimens is from Nooktah, a man older than Kishu ; another from Atana, a woman of about the same or a little more advanced age than Kishu ; and the third from Avia, a girl of ten to twelve years of age. A detailed report on these three brains is being prepared, as hitherto mentioned, by Mr E. A. Spitzka ; my independent work on the same extends over those points only which are of particular interest in connection with the specimen here described, including the more important measurements.

The general gyration in these additional Eskimo brains, compared with that in average adult whites, is very good, particularly over the frontal lobes, in Nooktah, good in Atana, rather simple in Avia. In all the external conformation is more complex on the left hemisphere. The frontal gyration in Nooktah is not less complex than that in Kishu, but the whole brain of the latter is more developed and richer.

The insulæ are both quite exposed anteriorly in Atana, less so in Avia, and covered, or very nearly so, in Nooktah as well as in Kishu.

The ascending frontal gyri are both very strong in Atana, the ascending parietal gyri on both sides and the ascending frontal on the right in Avia.

The anterior and posterior portions of the presylvian are separate in all three brains, as in that of Kishu.

The central fissure, which in Kishu commenced in the Sylvian, has a similar origin on the right side in Avia; in all other instances it reaches near to the Sylvian. The superior termination of the fissure reaches the superior border in Nooktah and on the right in Atana, and passes slightly to moderately over it on the left in Atana and on both sides in Avia. In the girl the course of the fissure is remarkably vertical.

A longitudinal division of the mesial part of the superior frontal gyrus, found in Kishu, is also present complete on left, interrupted on right, in Nooktah; slightly incomplete on left, small traces on right, in Atana; and on the right in Avia.

The limbic lobe shows traces of longitudinal division, as on the right in Kishu, on the right in Nooktah, and on the left in Avia. The lobe that shows the traces of division is in both cases, so far as these traces extend, higher than that of the opposite side, as was also the case in Kishu.

A furrow somewhat similar to the pre-precentral vertical furrow in Kishu is seen on the right in Nooktah, while sinuosities, somewhat similar to the right vertical post-postcentral one in Kishu, occur on the left in Atana and on the right in Avia.

The postcentral sulcus is single in all cases, except on the left in Avia, where it exists in two portions.

The temporal lobe is slightly higher on the left side in Nooktah and Avia (see the measurements). The first temporal gyrus is in all cases moderately to well developed. The medio-temporal sulcus, though present in segments in Nooktah and Atana, is by no means as clearly distinguishable as in Kishu.

Broca's cap, or that part of the inferior frontal convolution situated between the two portions of the presylvian, is, contrary to what was the case in Kishu, in all these brains better developed on the left side.

The extremities of the occipital lobes are in all three brains of about equal size and not disproportionate as in Kishu.

ADDITIONAL AND COMPARATIVE MEASUREMENTS

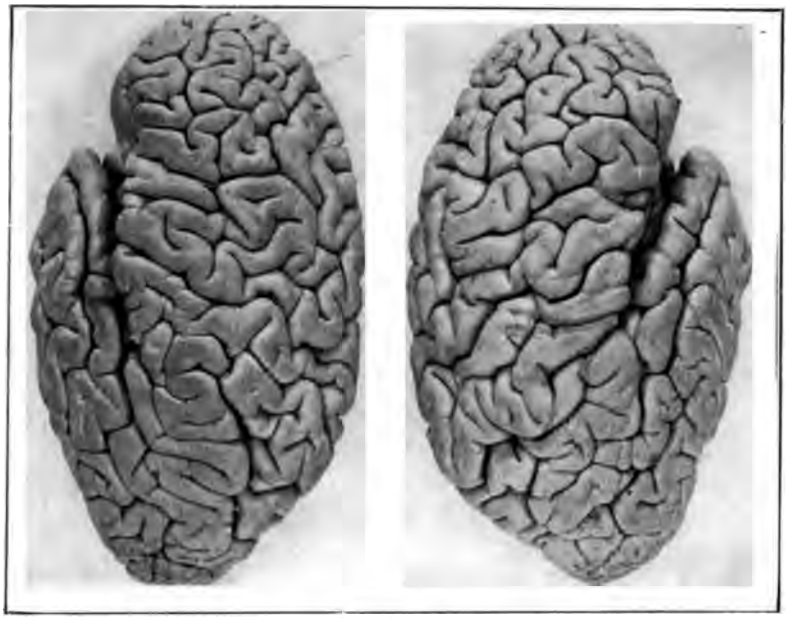
The subject of brain measurements is still in its infancy. Although many brains have been measured, particularly since Huschke and Broca, there is yet no standard system of encephalometry comparable with that of the measuring of the head or cranium. Every author of importance has thus far chosen his own points from which to measure, and there is no regulation of either the methods or instruments. There is no more important part of the body and at the same time no part with which more care and accuracy are required in measuring, than the brain, and these two conditions ought to prompt an early and thorough systematization of procedure. As it is, the brain measurements of one author can scarcely be compared or joined with those of any other.

The most disturbing factors in measuring the brain are, first, its softness and the consequent yielding and deformation of the organ when removed from the cranial cavity; this difficulty can now be effectually counteracted by a formaline-alcohol or formaline hardening of the organ before the opening of the skull.

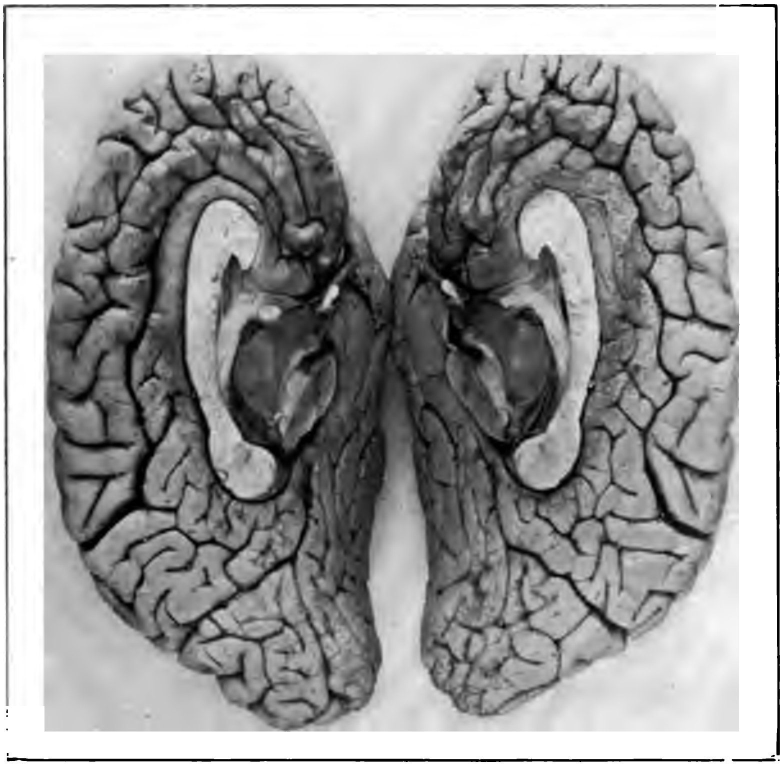
The second important factor, which thus far has not received sufficient attention, is the different shape of the brain in different individuals and especially in different races. No one would think of comparing, or uniting in a series, the dimensions of a dolichocephalic with those of a brachycephalic skull, and similar distinctions should be established in brain measurements.

The choice of instruments is very important. Even if the tape only be used, considerable differences in the measurements are obtained according to the width of the same.

Some, and perhaps many, of the measurements of the brain carry valuable indications which we today do not appreciate. The knowledge of the organ will certainly progress, and meas-



Lateral aspect



Mesial aspect

THE HEMISPHERES OF KISHU'S CEREBRUM

urements taken with care, even if not essential now, may in the future be found of value.

A more detailed discussion here of these important matters would be somewhat irrelevant to the subject of this paper. The above remarks are thought to be a proper introduction to the following figures and comparisons.

The measurements of Kishu's brain, which was carefully preserved, between cotton, in a mixture of formaline and alcohol, are, as I have certified on the skull, almost absolutely correct. The brains of Nooktah, Atana, and Avia were preserved in a weak solution of formaline. Nooktah's brain is fairly well preserved and its measurements are apparently quite correct; the brains of Atana and Avia, however, have suffered a rather considerable change in form, and the absolute measurements of these specimens have but little meaning. The relative proportions of the various parts of the cerebrum were undoubtedly much less affected than the absolute measurements and are probably still fit for consideration.

The surface measurements were taken by a tape 0.8 cm. broad, while the diameters were obtained on a graduated plane (Mathieu's) and by the accurate sliding compass used in osteometry. Three repeated measurings gave fairly even, though in but very few instances exactly the same, results.

The points from which the various dimensions were taken and the methods will be explained with each measurement.

MEASUREMENTS

APPROXIMATE LENGTH OF THE LINES OF NORMA ANTERIOR, KISHU:

	Left		*Right*
Antero-lateral lines..........	11.5 cm.		10.3 cm.
Anterior lines[1]		8.3 cm.	
Postero-lateral lines.........	8.2 cm.		7.8 cm.
Posterior lines[2]		5.9 cm.	

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[1] Taken between two cardboards applied to the antero-lateral planes of the brain, the line measured touching the anterior surface of the frontal lobes.

[2] Obtained in a way similar to that of the anterior lines.

MAXIMUM LENGTH OF THE HEMISPHERES

	Left	*Right*
Kishu	18.0 cm.	17.9 cm.
Nooktah	16.8 cm.	17.0 cm.
Atana	(17.1 cm.)	(17.1 cm.)
Avia	(15.3 cm.)	(15.3 cm.)

In one of the males the length of the left exceeds slightly that of the right hemisphere, while in the other male the condition is reverse; in the two females the length of both hemispheres is equal.

In whites the left hemisphere is almost generally slightly longer (Eberstaller,[1] Cunningham[2]).

MAXIMUM WIDTH OF THE CEREBRUM; CEREBRAL INDEX, COMPARED TO CEPHALIC (*on the living*).

		$\left(\frac{\text{Breadth} \times 100}{\text{Length}}\right)$	$\left(\frac{\text{Breadth of Head} \times 100}{\text{Length of Head}}\right)$
Kishu	13.6 cm.	75.8	76.26
Nooktah	13.1 cm.	77.5	81.4
Atana	(12.3 cm.)	(71.9)	80.6
Avia	(11.6 cm.)	(75.8)	72.9

It can be seen that while the brains of Kishu and Nooktah have kept nearly the same relative proportions as they must have had in life, that of Atana became relatively longer and narrower and that of Avia shorter.

ARC MEASURES ALONG THE SUPERIOR BORDER[3]

a. *Anterior Point (Cunningham) to Central Fissure.*

	Left	*Right*
Kishu..	17.0 cm. or 63.0 %,	17.7 cm. or 65.1 % of the total mesial length.
Nooktah	16.7 cm. or 66.5 %,	16.7 cm. or 64.5 %.
Atana..	(15.3 cm. or 59.8 %),	(15.0 cm. or 60.5 %).
Avia..	(15.5 cm. or 64.6 %),	(15.0 cm. or 62.5 %).

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[1] Eberstaller, *Das Stirnhirn*, Wien and Leipzig, 1890.

[2] Cunningham, D. J., "Contrib. to the Surface Anatomy of the Cerebral Hemispheres." *Roy. Irish Acad.*, *Cunningham Mem.*, VII, 1892. All the following references to Cunningham relate to this work.

[3] Eberstaller measured from the anterior perforated space to the occipital pole. Cunningham, whom I follow, takes the same measures "from a point on the upper or mesial border which corresponds to the level of the outer part of the superciliary

This relative length of the precentral part to the total mesial arc, this latter being taken as 100, is termed by Cunningham the *frontal* or *fronto-Rolandic index*, and is in whites, according to the same author (pp. 55, 175), as follows:

In 12 5½ to 6½ mos. embryos	52.7
In 24 full-term fœtuses	53.5
In 82 adults	53.3

In apes and monkeys from 55.9
in chimpanzee to 45.4
in mangaby.

b. *Central to Parieto-Occipital Fissure*

	Left	*Right*	
Kishu	4.3 cm. or 15.9 %,	4.3 cm. or 15.8 %	of the mesial arc.
Nooktah	3.9 cm. or 15.5 %,	5.0 cm. or 19.3 %	of the mesial arc.
Atana	(5.8 cm. or 22.7 %),	(5.2 cm. or 21.0 %)	of the mesial arc.
Avia	(5.1 cm. or 21.2 %),	(5.3 cm. or 22.1 %)	of the mesial arc.

Cunningham, who terms the proportion of the central parieto-occipital fissure segment to the whole mesial arc (this being taken as 100, the *parietal index*), obtained the following in whites (p. 55):

	Parietal Index
In 12 5½ to 6½ mos. embryos	28.5
In 24 full-term fœtuses	25.7
In 82 adults	25.5
In 4 orangs	21.3
Further, in 4 chimpanzees	19.9
In 5 cynocephali	22.6
In 5 macaques	19.0
In 7 cebi	20.6.

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margin of the frontal lobe. This border is very far from being horizontal. Its outer part is on a much higher level than the inner part. As it is traced inwards it is seen to take a sudden curve downwards towards the cribriform plate of the ethmoid bone, where it merges with the mesial border. A line drawn horizontally inwards from the high outer part of the superciliary border of the frontal lobe cuts the mesial border of the cerebrum at the point which I arbitrarily selected as the anterior end of the cerebrum. It lies, as a rule, just below the most projecting part. Behind I took the most prominent part of the occipital pole." "The first of these points may be distinguished as the *frontal point*, and the latter as the *occipital point*. Further, the distance between these two points measured along the upper border of the hemisphere may be termed the *mesial length*." (Loc. cit., pp. xi, xii.)

Cunningham's anterior point has no advantage over that of Eberstaller, and I employ it only to enable comparison of my own with Cunningham's indices.

c. *Parieto-occipital Fissure to most Prominent Point on the Occipital Pole*

	Left	*Right*
Kishu	5.7 cm. or 21.1 %,	5.2 cm. or 19.1 % of the mesial arc.
Nooktah	4.5 cm. or 17.9 %,	4.2 cm. or 16.2 % of the mesial arc.
Atana	(4.5 cm. or 17.6 %),	(4.6 cm. or 18.5 %) of the mesial arc.
Avia	(3.4 cm. or 14.2 %),	(3.7 cm. or 15.4 %) of the mesial arc.

Cunningham terms the relative distance of the parieto-occipital fissure from the most prominent point in the occipital pole the *occipital index*, and obtained for whites (pp. 55, 56):

In 12 5½–6½ mos. embryos	18.8
In 24 full-term fœtuses	20.8
In 82 adults	21.2 ; also, in
4 orangs	23.2
4 chimpanzees	24.2
5 cynocephali	29.7
5 macaques	31.0
7 cebi	33.0.

Among adult whites, in 45 men the occipital index was 20.8;
in 35 women the occipital index was 21.7.

The total mesial arc (from the anterior point, Cunningham, to the most prominent point on occipital pole) was:

	Left	*Right*
Kishu	27.0	27.2
Nooktah	25.1	25.9
Atana	(25.6)	(24.8)
Avia	(24.0)	(24.0).

The above indices show in the Eskimo some remarkable features which are undoubtedly more than individual variations. There are in all the Eskimo, but especially in the men, relatively high frontal and low parietal indices. The parietal indices in the two females and the occipital indices in the two males and the adult female, though also lower, approach more those in whites. There is in the four Eskimo, according to these surface measurements, relatively a more extended superior frontal and a more restricted superior parietal area than in the average whites.[1]

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[1] Compare in this connection, and with the horizontal dimensions that follow, the seemingly conflicting measures of Féré, Passet, and Giacomini, referred to by Dejerine,

There is another and somewhat more accurate way in which the dimensions of the main parts of the cerebrum may be determined. If the hardened hemisphere is placed on the graduated board in such a way that the most prominent frontal and occipital points are on a line which runs lengthwise along the middle of the board, we can then secure, by means of two vertical planes and a rod-measure or an ordinary compass, any desirable horizontal distance from the cerebral extremities. Such distances, compared with the total horizontal length of the hemisphere, give indices which are somewhat more accurate and perhaps not inferior in value to those obtainable by surface measuring. Following this procedure on the Eskimo brains, I have obtained the following figures and proportions:

a. *Horizontal Length, Frontal Pole to Superior Extremity of Central Fissure*

	Left	*Right*
Kishu....	10.9 cm. or 60.6 %,	10.8 cm. or 60.4 % of the length of the hemisphere.
Nooktah..	10.9 cm. or 64.9 %,	10.7 cm. or 62.9 % of the length of the hemisphere.
Atana.....	(9.6 cm. or 56.1 %),	(10.0 cm. or 58.5 %) of the length of the hemisphere.
Avia......	(9.8 cm. or 64.1 %),	(9.3 cm. or 60.8 %) of the length of the hemisphere.

b. *Horizontal Distance, Superior End of Central to Parieto-occipital Fissure* [1]

	Left	*Right*
Kishu....	4.1 cm. or 22.8 %,	4.0 cm. or 22.3 % of the length of the hemisphere.
Nooktah..	2.3 cm. or 13.7 %,	3.5 cm. or 20.6 % of the length of the hemisphere.

Anat. d. Centres Nerveux, Paris, 1895, p. 249. The coincidence of the relatively somewhat small occipital with relatively small parietal lobes is quite curious. Gratiolet (quoted by Cunningham, p. 59) states that in man the occipital lobe is extremely reduced; and formulates the law that "the more highly organized a member of the group is, the smaller is the relative size of the occipital lobe." Quite as striking, however, is the small relative size of the parietal lobe in the ape.

[1] The measurements are taken between the points of intersection by the fissures of the superior border of the hemisphere. Where the parieto-occipital fissure bifurcated before reaching the superior border (left in Atana, right in Avia), the measurement was taken to a prolongation of the main limb of the fissure. Same with surface measurements.

Left *Right*
Atana.. (5.1 cm. or 29.8 %), (4.6 cm. or 26.9 %)
of the length of the hemisphere.
Avia.... (4.0 cm. or 26.1 %), (4.4 cm. or 28.8 %)
of the length of the hemisphere.

c. *Horizontal Distance, Parieto-occipital Fissure to Occipital Pole*

Left *Right*
Kishu.... 3.0 cm. or 16.7 %, 3.1 cm. or 17.3 %
of the length of the hemisphere.
Nooktah. 3.6 cm. or 21.4 %, 2.8 cm. or 16.5 %
of the length of the hemisphere.
Atana... (2.4 cm. or 14.0 %), (2.5 cm. or 14.6 %)
of the length of the hemisphere.
Avia.... (1.5 cm. or 9.8 %), (1.6 cm. or 10.5 %)
of the length of the hemisphere.

These measurements show almost generally a higher relative proportion of the region between the central and parieto-occipital fissures than was the case with the surface measurements, which indicates that the region is relatively more flat than the others.

Two more notable facts shown by both the arc and the horizontal measurements are a very small parietal and a large occipital portion on the left in Nooktah and the small occipital portions in Avia.

A more detailed study of the figures shows that, so far as their size is concerned, the main portions of the cerebrum tend to compensate each other.

DISTANCE OF THE LOWER EXTREMITY OF THE CENTRAL FISSURE FROM THE FRONTAL POLE

Cunningham measured this distance over the surface of the frontal lobe, comparing the dimension thus obtained with the entire arc running in the same line from the mesial border of the anterior to that of the posterior extremity of the hemisphere. I have followed the same method, but have supplemented it with the horizontal distance, as with the preceding measurements. The results are as follows:

Surface Distance of the Base of the Central Fissure from the Mesial Border of the Anterior Extremity

	a. Arc to the base of central fissure.		*b.* Complete lateral arc.		Centesimal relation of *a* to *b*.	
	Left	*Right*	*Left*	*Right*	*Left*	*Right*
Kishu....	10.8 cm.	11.1 cm.	25.2 cm.	24.5 cm.	42.9	45.3
Nooktah..	10.7 cm.	10.5 cm.	23.3 cm.	23.1 cm.	45.9	45.5
Atana....	(11.2 cm.	10.6 cm.)	(22.9 cm.	23.1 cm.)	(48.9	45.9)
Avia.....	(8.0 cm.	8.6 cm.)	(21.3 cm.	21.1 cm.)	(37.6	40.8)

The centesimal relation of *a* to *b* is termed by Cunningham (p. 179) the lower Rolandic index and was:

In 17 adult whites, males	43.7
In 20 adult whites, females.....................	43.0

The index differed but little in children and human embryos; in apes and monkeys it ranged (p. 175) from 39.2 in the orang and chimpanzee to 43.8 in cebus.

The *horizontal* distance of the base of the central fissure from the frontal extremity, and its centesimal relations to the length of the hemisphere, are as follows:

	a. Distance to base of central fissure.		Centesimal relation of *a* to length of hemisphere	
	Left	*Right*	*Left*	*Right*
Kishu..........	7.3 cm.	6.5 cm.	40.6	36.3
Nooktah.......	7.6 cm.	7.5 cm.	45.2	44.1
Atana..........	(8.3 cm.	7.8 cm.)	(48.5	45.3)
Avia...........	(5.4 cm.	5.9 cm.)	(35.3	38.6).

LENGTH OF THE CENTRAL FISSURE

	a. Diameter, from lower to upper extremity, taken by the sliding compass.				*b.* Length measured by a thread following all the windings of the fissure.			
			Centesimal relation of *a* to length of hemisphere.				Centesimal relation of *b* to mesial length.	
	l.	*r.*	*l.*	*r.*	*l.*	*r.*	*l.*	*r.*
Kishu......	9.0	8.6	50.0	48.0	11.7	11.5	43.0	42.3
Nooktah....	8.0	8.4	47.6	49.4	10.7	11.0	42.6	42.5
Atana......	(7.3	7.7)	(42.7	44.9)	(10.8	10.6)	(42.2	42.7)
Avia........	(7.9	7.7)	(51.6	50.3)	(11.0	10.3)	(45.8	42.9)

Cunningham (p. 191), taking the length of the fissure according to *b* and comparing it with the mesial arc, obtained in whites:

In 5½ to 6½ mos. embryos	16.7
In full-term fœtuses	32.8
In 4- to 5-year-old children	33.9
In 16 adult females	40.1
In 14 adult males	38.6
and in the chimpanzee	51.1
orang	47.2
hamadryas	41.1

The length of the fissure, as seen from the above, is relatively greater in the Eskimo than in the whites; there is no decided sexual difference.

The straight length, or diameter, of the fissure can serve, in connection with the horizontal measures (from the vertical plane rising from the anterior extremity of the hemisphere to the two extremities of the fissure), in determining a Rolandic angle (by projection).

LENGTH OF THE SYLVIAN

Taking this length with a compass, from the exterior point of intersection of the Sylvian by the anterior or horizontal portion of the presylvian, to the angle which the ascending terminal branch forms with the main limb of the Sylvian, Eberstaller (quoting Cunningham) found it in whites as follows:

Up to 5.0 cm., left in 22 %, right in 45 % of hemispheres.
5.1–6.0 cm., left in 42 %, right in 44 % of hemispheres.
6.1–7.0 cm., left in 27 %, right in 11 % of hemispheres.
Over 7.0 cm., left in 9 %, right in 0.6 % of hemispheres.

These figures show that the left Sylvian is more often the longer. Cunningham (p. 122) obtained similar results, but he measured the fissure from "the point at which its trunk appears on the outer surface of the hemisphere." As this point is almost generally less clearly defined than that employed by Eberstaller, I follow the latter authority. The Sylvians in the Eskimo measured as follows:

			Centesimal relation to the length of the hemisphere	
	Left	*Right*	*Left*	*Right*
Kishu..........	6.5	5.2	36.1	22.9
Nooktah.........	6.2	4.8	36.9	28.2
Atana..........	(6.4	5.1)	(37.4	29.8)
Avia...........	(5.4	5.9)	(35.3	38.6)

The left fissure is, in three of the Eskimo, both absolutely and relatively, decidedly longer than the right one.

Two additional useful and quite easy measures are, I think, the maximum breadth of the frontal lobes, measured by the sliding compass, with the branches applied over the most prominent points on the dorsum of the orbital parts of the inferior frontal gyri; and a diameter between the extremities of the temporal and occipital lobes. These dimensions in the Eskimo are as follows:

BREADTH OF THE FRONTAL LOBES

	Breadth	Centesimal proportion to maximum width of the cerebrum
Kishu..................	11.5 cm.	84.6
Nooktah..............	10.0 cm.	76.3
Atana..................	(7.9 cm.)	64.2
Avia..................	(7.5 cm.)	64.7

These figures demonstrate well the superiority of the frontal lobes in Kishu's cerebrum, and the inferiority in this respect to both the males of both of the females.

TEMPORO-OCCIPITAL LOBES

			Centesimal relation to the length of the hemispheres	
	Left	*Right*	*Left*	*Right*
Kishu.........	14.2 cm.	14.3 cm.	78.9	79.9
Nooktah.......	13.2 cm.	13.5 cm.	78.6	79.4
Atana..........	(13.1 cm.)	(13.4 cm.)	(76.6)	(78.4)
Avia..........	(12.0 cm.)	(11.7 cm.)	(78.4)	(76.5)

In this particular measurement the four brains show remarkable similarity.

PREVIOUS RECORDS ON ESKIMO BRAINS

The only previous records concerning Eskimo brains of which I could learn are those made by Chudzinski, published in the *Bulletin de la Société d'Anthropologie de Paris*, 1886.

The brains described by this author were those of Tobias Ignatius, male, 23 years; Paulus Abraham, male, 35 years; and Ulrika Hénocq, female, 24 years. The locality from which these subjects came is not stated, but there are reasons to believe that they belonged to the eastern Greenland Eskimo.

The three brains present some interesting similarities, but also many characteristics different from those of any of the specimens noted in this paper. In order to facilitate a comparison I shall introduce the principal part of Chudzinski's report.

The brains show " a considerable volume of the cerebral hemispheres "; " then one can see that the convolutions which constitute the external surface of the hemispheres are large, simple, and very poor in secondary divisions, and that the sinuosities are but little flexuous." " That simplicity is especially marked over the frontal lobes"; "the same lobes are at the same time flattened infero-superiorly."

" The Sylvian fissure appears to be shorter than ordinarily, nearly horizontal, and of very simple contours," except in the woman, where it is little more complex, especially on the right. " Its anterior branch is generally very short and in the brain of P. A. altogether hidden by the temporal lobe."

" The Rolandic fissure is very long." " It is flexuous, especially in P. A. Ends on mesial surface " (in all ?).

" Occipital fissure very short externally. Calcarine fissure long and flexuous, especially in U. H."

" The frontal lobe is relatively short; the other lobes are, on the contrary, well developed, especially the parietal."

" The first frontal gyrus is very large, especially in Tobias, but shows only a few incisures."

" The development of the second convolution is enormous, especially in P. A." " The gyrus is very simple in Tobias." " Among other features, there is a double anastomosis with the ascending frontal."

" The third frontal gyrus is very little developed; it is short and as *ramassée sur elle même*." " In Tobias it is reduced to a small, nearly smooth isle." Better developed in U. H.

" Ascending frontal gyrus very large." " Ascending parietal gyrus very flexuous in Paulus, very large in Tobias." The two gyri (asc. frontal and asc. parietal) are slender in U. H.

" The parietal convolutions generally simple and very extended," especially the second inferior.

" Occipital lobe generally simple, especially in Tobias."

Temporal lobe: " Extreme slenderness of first convolution "; " uncommon size of second convolution."

Internal (mesial) surface: " Enormous development in breadth of the mesial part of the first frontal convolution, especially in Tobias; a division of that convolution into two secondary gyri by an uninterrupted sulcus on the left hemisphere in Paulus." The secondary sulcus seems to be continuous with the subfrontal fissure. Similar sulcus on right in Paulus, but in several places interrupted by annectent gyri.

The convolution of the corpus callosum is generally very extended; but its breadth is very remarkable in Tobias, in its posterior part, and anteriorly in Ulrika, in whom it seems to divide itself along its middle into two secondary gyri."

The ovalaire lobule is enormous in Ulrika; on the other hand, the cuneiform is small, and in Ulrika it is reduced to a "*pli de passage*," hidden, in large part, in the calcarine and occipital fissures.

The similarities in the brains reported upon by Chudzinski and the one described here consist of the large volume of the cerebral hemispheres; long central fissures; sagittal division of the mesial parts of the superior frontal gyri; the large size of the limbic lobe in Tobias, and the large size of the lobe with a tendency toward a longitudinal division in Ulrika.

The dissimilarities are: the poor differentiation in Chudzinski's specimens of the convolutions and the simple character of the sulci, especially over the frontal lobes; a defective development of the inferior frontal convolution (particularly in Tobias); very large ascending frontal and ascending parietal convolutions; simplicity of parietal convolutions; great slenderness of the superior temporal gyri; and very small cuneus.

The causes of the many dissimilarities are not clear. The morphological inferiority of the two male brains described by Chudzinski, and, on the other hand, the marked superiority of Kishu's and even of Nooktah's brain, may be to some extent individual conditions and represent more the extremes than the average of Eskimo brains. At the same time it is possible that Paulus Abraham and Tobias Ignatius belonged to some family of the great Eskimo tribe intellectually less developed than the Smith Sound group to which Kishu and Nooktah belonged. The Smith Sound party which Lieutenant Peary brought to New York were by no means dull or incapable people. This is especially well demonstrated in Menee, the son of Kishu, who has not only shown a remarkable facility for adjusting himself in every way to civilized life, but has made very good progress in the public school.

The marked differences of the specimens described by Chudzinski and in this paper from those of the whites, as well as among themselves, makes a future acquisition of Eskimo brains very desirable.

SUMMARY OF THE ARCHEOLOGY OF SAGINAW VALLEY, MICHIGAN—II

By HARLAN I. SMITH

SAGINAW RIVER VALLEY

BAY COUNTY

Saginaw River.—The History of Saginaw County[1] states that "the water courses of the district comprise the Sac-haw-ning, or home of the Sacs. . ."

Tchigaiinibewin Village Site.—The History of Saginaw County (p. 592, ¶ 2) states that "it must also be remembered that the Great Camp, or Kepayshowink [Ka-pay-shaw-wink], of these wandering bands did not hold the same position in summer as in winter, so that he who relies upon Indian legends simply, and without further inquiry, might associate the summer camp on the lake shore with the winter camp of the interior. Both were great camps; . . . the second, or summer camp, was north of Nesh-ko-ta-younk; . . . [and] the first in coming down from the lake. In winter the Bay-shore camp was called Tchigaiinibewin by travelers as being 'close by' the great camp, and in summer a reversal of terms was simply used to denote that the upper camp was the place 'close by.'"

Nesh-ko-ta-younk Village Site. — The History of Saginaw County (p. 592) states that the "summer camp [Tchigaiinibewin], was north of Nesh-ko-ta-younk."

McCormick Mound.—W. R. McCormick,[2] referring to the Water Street mound, wrote as follows:

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[1] Page 288, ¶ 2.

[2] *Hist. Sag. Co.*, p. 284, ¶ 3, second part; and ¶ 4, p. 285. McCormick, "Mounds," p. 381, ¶ 1, 2, and 3, gives the same information, with the exception

"Some thirty rods below, on Water street, between Twenty-second and Twenty-third streets, is an elevation, the highest on the river, on which is located the Bay City brewery, Barney hotel, the residence of W. R. McCormick and other residences, comprising nearly two acres. I wish to describe this elevation as I saw it, in a state of nature, over forty-five years ago. For many years it was considered to be a natural elevation of the land, but subsequent excavations have proved it to have been constructed by some remote race of people.

"When I first became acquainted with the location it was covered with a dense growth of timber, with the exception of the mound and about an acre and a half in the rear of it, *where* [from which] the earth was taken *from* to build the mound. It was then a duck pond, with water three feet deep, grown up with alder bushes. In grading Twenty-second street through the north end of *the* [this] mound, some years since, we found at a depth of 11 feet three skeletons of very large stature with large earthen pots at the head of each. In excavating for the cellar of the Bay City brewery, we found at the depth of four feet the remains of Indians in a good state of preservation, with high cheek bones and receding forehead, while, below these again, at the depth of four or five feet, the remains of a more ancient race, of an entirely different formation of skull, and with those burned stone implements and pottery were found. I have been unable to preserve any of these skulls, as they crumbled to dust when exposed to the air. I found one skeleton in a sitting position,

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of the parts here in italics and with the addition of the matter here in brackets. McCormick (W. R.), "Mounds and Mound-Builders of the Saginaw Valley." By W. R. McCormick, of Bay City. Pp. 379-383. *Pioneer Collections*, Vol. IV [1881]. Lansing: W. S. George & Co., 1883. 8°.

W. R. McCormick, according to *Hist. Sag. Co.*, pp. 180-192, was born in 1822, removed from Albany, N. Y., to the present site of Flint, Genesee Co., Michigan, in 1832, later moved to Portsmouth, Bay Co., Michigan, and finally lived in Bay City. He was the first inhabitant of Saginaw valley to make any permanent archeologic records. Author of various items in *Hist. Sag. Co.*, pp. 117-120, 282-287, and "Mounds" above noted.

facing the west, with a very narrow head, and long, as if it had been compressed. I laid it aside in hopes to preserve it, but in a few hours it had crumbled to pieces.

"This mound is full of the remains of ancient pottery and small stones that have been through the action of fire. A friend of mine found an awl made of copper which was quite soft with the exception of about an inch from the point which was so hard that a file would scarcely make an impression on it. This seems to me to show that the Mound-Builders had the art of hardening copper."

The use of the word "race" instead of "tribe" is probably a mistake in nomenclature, since the author evidently did not refer to the early European explorers or settlers. The statement that skeletons of very large size were found is probably due to misjudgment. Such remarks are commonly heard in the folklore repeated to explorers throughout the region.

It is still possible that this site is a natural hill in which were graves, and that the "duck pond" was also natural and not the source of the material of which the mound was made. Many of the hills in this region are formed by the wind and are increased and decreased by the same means. This would satisfactorily account for burials at different depths.

Fragile bones that would crumble on exposure to the direct rays of the sun, or even to dry air, may often be preserved without the use of other means than by wrapping in paper and boxing quickly so as to retain the moisture and allow them to dry slowly enough to become hard without warping.

While the narrow skull, described by Mr McCormick, may have been a case of post-mortem deformation due to pressure of the soil, it may more probably have been the skull of the rarer of two types, since not only the Sauk and Ojibwa have inhabited the region, but the Potawatomi and other tribes have visited it; and again, two forms of crania have been found elsewhere in this valley.[1]

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[1] See Fobear Mound No. 1, under Saginaw County.

The statement that part of the point of the awl was so hard that a file would scarcely make an impression on it is a fallacy probably derived from the feel and effect on the file of the thickly oxidized metal as compared with that of a clean piece of metallic copper.

The term "Mound-builders," as used by Mr McCormick, probably refers to a mysterious extinct people, whereas the word "Indians" would doubtless have been more suitable in this connection.

William McCormick[1] states that "in the vicinity of the residence of William R. McCormick, that being the highest land, and where they [the Sauk] had attempted to fortify themselves; . . . at the present time, by digging in this hill, you will find it full of human bones."

Mr McCormick,[2] referring to the mounds of Saginaw valley, states that "the plow has helped to level many of them, with the exception of the Fraser, Fitzhugh, and McCormick mounds. And to prove that the last three are artificial and not natural is the fact that in the rear of all these are low places, showing where the earth had been ***taken from*** [procured] to build the mounds. . . .

"Again, the soil on the mounds differs from the soil around them with the exception of the low places referred to from where the earth was taken; . . . And in no part of the valley will you find those relics except in those mounds."

The description of the varieties of soil is perhaps too arbitrary, and specimens such as are found in the mounds are found also on village sites.

Professor Thomas[3] states that there is a "large artificial elevation on Water street, in Bay City, east side. . . . Described by W. K. McCormick, in Michigan Pioneer Collection, vol. 4 (1881), p. 382."

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[1] *Hist. Sag. Co.*, p. 118.

[2] *Hist. Sag. Co.*, p. 287, ¶ 1. McCormick, "Mounds," p. 383, ¶ 1–3, gives the same information with the exception of the parts here in italics and with the addition of the matter here in brackets.

[3] Thomas, *Catalogue*, p. 107.

Water Street Mounds.—W. R. McCormick[1] wrote as follows: "On the Saginaw river, toward its mouth, when we come to what is now the corner of Twenty-fourth and Water streets in Bay City, where the Center House now stands, we find the old McCormick homestead. Here were two large mounds in the garden, which my father plowed and scraped down. They contained a number of skeletons, stone axes, knives, and quite an amount of broken pottery."

Professor Thomas[2] states that "two large mounds, now gone, stood on the east side of the Saginaw River, at the corner of Twenty-fourth and Water streets, Bay City. . . Described by W. K. McCormick, in Michigan Pioneer Collection, vol. 4 (1881), p. 382."

More Mound.—W. R. McCormick[3] wrote as follows: "We will now pass over to the west side near the mill of More, Smith & Co. There was here, 45 years ago, a mound just above the mill about 100 feet across in a circular form and about three feet high. Originally it must have been much higher. I have never examined this mound, but have understood from old settlers that there were a great many stone implements found in it. The plow has nearly leveled it, so that it is scarcely noticed any more."

Professor Thomas[4] states that "there was a mound on the west side, near the mill of M. Smith & Co." as "described by W. K. McCormick, in Michigan Pioneer Collection, vol. 4 (1881), p. 382."

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[1] *Hist. Sag. Co.*, p. 284, ¶ 3, first part. McCormick, "Mounds," p. 380, ¶ 5, p. 381, first part.

[2] Thomas, *Catalogue*, p. 107.

[3] *Hist. Sag. Co.*, p. 285, ¶ 1. McCormick, "Mounds," p. 381, ¶ 4, gives the same information with the exception of the parts here in italics and with the addition of the matter here in brackets.

[4] Thomas, *Catalogue*, p. 107.

West Bay City Village Site.—On the sand ridge close to the river at West Bay City, where the railroad roundhouse is located, were found fragments of chert and burned stones in sufficient numbers to suggest that the place had been a village site.

West Bay City Graves.—In the West Bay City village site several human skeletons were dug out by the railroad section workmen, one of whom, on inquiry, reported the same. The place of these graves appeared to be a natural sand ridge in which interments had been made. This burial site may be identical with what Mr McCormick terms the Birney mound.

Birney Mound.—W. R. McCormick[1] wrote as follows: "The mound which was located near the west end of the Detroit & Bay City railroad bridge, [which] for reference I will call the Birney mound, as it is located on the lands of that great philanthropist, the late Hon. James G. Birney. This mound was not so large in circumference, but much higher than the one just noticed."[2]

"In this *were* [was] also found human bones, in a much better state of preservation than any of the rest. I procured from this mound a skull with a hole in it just above the temple bone, produced by a sharp instrument, which undoubtedly caused death. This skull I presented to J. Morgan Jennison, of Philadelphia. It was of an entirely different formation from the Indian skull of the present day, as it did not have their high cheek bones nor their receding forehead, but a very intellectually developed head, showing that it was of a different race of people from the Indian. Some years since some boys were digging in the side of the mound, as they had often done before, to get angle-worms for fishing, when they came across a small silver canoe, about five inches long. *A* [, and a] gentleman who was fishing with them, offered them 50 cents for it, which they accepted. After cleaning it up, he found it to be of exquisite workmanship, with the projecting ends tipped with gold. [[Query.—Was not this a present from some early Catholic missionary of whom history makes no mention?]] A rough copper kettle of peculiar shape and make, having been wrought into shape by hammering, without any seam, was also taken from one of *these* [those] mounds, and is now in the State capitol among*st Mr.* [O. A.] Jenison's [Jennison's] collections of *antiquities* [antiquity [1]]."

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[1] *Hist. Sag. Co.*, p. 285, ¶ 2, p. 286. McCormick, "Mounds," p. 381, ¶ 5, and p. 382, ¶ 1, gives the same information with the exception of the parts here in italics and with the addition of the matter here in brackets.

[2] Refers to the More mound "about 100 feet across . . . and about three feet high."

On August 28, 1890, Mr McCormick told the writer that the hole in the skull above mentioned may have been made as a post-mortem religious custom. Regarding the remarks concerning the shape of the skull, it must be remembered that, at the time Mr McCormick wrote, exact somatologic methods were unknown in his section, and the great difference in the shape of the skull from that of the others found (unless the skull were that of a Caucasian, possibly an early French voyageur) was probably exaggerated owing to lack of familiarity with crania. The word "race," in this connection as in others, is used indiscreetly by the author.

The silver canoe may have been introduced after the first contact with the early French traders. It suggests that the burial was comparatively recent.

The Birney mound may have been merely a natural sand ridge in which there were graves, and possibly is identical with the site of the West Bay City graves.

Professor Thomas[2] states that "a mound formerly stood near the west end of the Detroit and Bay City Railroad bridge, on land of James G. Birney. . . . Described by W. K. McCormick, in Michigan Pioneer Collection, vol. 4 (1881), p. 382."

Lynn Graves.—W. R. McCormick,[3] referring to his preceding item about the Birney mound, wrote as follows: "The next mound was about half a mile up the river, and formerly stood in the center of Linn street, West Bay City, but has been graded down many years since. I was not there at the time, but was informed by others that it contained human bones and stone implements. Charles E. Jennison, a pioneer of Bay City, informs me that he dug up two skeletons many years ago in the side of this mound. He found with the skeletons two copper kettles, which he has still in his possession. I am inclined to think that these were not the remains of the original Mound-Builders, but a race of a subsequent period."

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[1] [Unfortunately the Legislature declined to purchase this valuable collection, and it has been repossessed by Mr Jenison.]

[2] Thomas, *Catalogue*, p. 107.

[3] *Hist. Sag. Co.*, p. 286, ¶ 1. McCormick, "Mounds," p. 382, ¶ 2.

On August 28, 1890, Mr McCormick told the writer that the mound was fifty or sixty feet in diameter and twelve feet high. The copper kettles suggest that the bodies with which they were found were buried since the advent of the whites and that the site was a burial place in the sand knoll rather than a mound.

Professor Thomas[1] states that "another [referring to his preceding item about the Birney mound] stood half a mile up the river, same side [west], at what is now the centre of Lean street, west Bay City." He also mentions that copper kettles were found and that the information was derived from W. K. McCormick, in Michigan Pioneer Collection, vol. 4 (1881), p. 382.

Fitzhugh Graves.—W. R. McCormick,[2] referring to his preceding item about the Lynn graves, wrote as follows: "We now proceed a half-mile more up the river, to the rise of ground in the rear of Frank Fitzhugh's grist-mill. This elevation, 45 years ago, when I first saw it, was the most picturesque spot on *the* Saginaw river. Here was also a beautiful spring of cold water, and was a favorite camping ground of the Indians. It was also, according to the Indian tradition, the original site of the Sauk village, and where the great battle was fought when the

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[1] Thomas, *Catalogue*, p. 107.

[2] *Hist. Sag. Co.*, p. 286, ¶ 2. McCormick, "Mounds," p. 382, ¶ 3 and 4, gives the same information with the exception of the parts here in italics and the addition of the matter here in brackets.

Chippewas exterminated that nation.[1] This I will call the Fitzhugh mound, as it is on the lands of Frank Fitzhugh. [¶] This elevation, comprising two or three acres, was always thought to be natural; but I am satisfied from recent excavations, and a low place to the southwest, that the earth has been taken from this point to raise the mound higher than the surrounding land, and that it is, therefore, mostly artificial. Then again, the land adjoining on the north is a yellow sand, while on the south the land fell off abruptly, and is composed of the same kind of soil as the mound, black sand and loam, from where the earth was taken. I am now speaking of this mound as it appeared 45 years ago. Since then the railroad company have excavated a part of it for ballasting *up* their road, and many other excavations and alterations have taken place, so that it has not the same appearance it had when I first saw it. Some years since Mr Fitzhugh, or the village authorities of Wenona, now West Bay City, excavated a street through this mound, which brought to light many relics, and proved beyond a doubt that this eminence was a mound built in remote ages. A great many skeletons were exhumed, together with a great many ornaments of silver, broken pottery, stone implements, etc., and, like the McCormick mound on the opposite side of the river, was full of broken stone which had been through the action of fire."

The site is probably a sand ridge, with graves in it and a natural pond near it. The ornaments of silver were doubtless the traders' ornaments commonly found in the region and suggest that the graves were made since the advent of the whites.

On August 28, 1890, Mr W. R. McCormick informed the writer that this mound was oblong and covered an acre and a half.

Mr McCormick,[2] referring to the mounds of Saginaw valley, states that "the plow has helped to level many of them, with the exception of the Fraser, Fitzhugh and McCormick mounds. [¶] And to prove that the last three are artificial and not natural is the fact that in the rear of all these are low places, showing where the earth had been *taken from* [procured] to build the mounds, . . . [¶] Again, the soil on the mounds differs from the soil around them with the exception of the low places referred to from where the earth was taken; . . . And in no part of the valley will you find those relics except in those mounds."

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[1] See footnote 2, p. 287, *American Anthropologist*, 1901.

[2] *Hist. Sag. Co.*, p. 287, ¶ 1. McCormick, "Mounds," p. 383, ¶ 1–3, gives the same information with the exception of the parts here in italics and with the addition of the matter here in brackets.

The statement regarding the varieties of soil is perhaps too arbitrary, and specimens such as are found in the mounds are found also on village sites.

Professor Thomas[1] states that there is "half a mile farther up the river, on same side, [referring to his preceding item about the Lynn graves, west side,] an artificial excavation back of Frank Fitzhugh's gristmill, now considerably disfigured. Many relics [were] found [in it]. Described by W. K. McCormick, in Michigan Pioneer Collection, vol. 4 (1881), p. 382."

Fitzhugh Village Site. — W. R. McCormick,[2] referring to his preceding item about the Lynn graves, wrote as follows: "We now proceed a half-mile more up the river, to the rise of ground in the rear of Frank Fitz-hugh's grist-mill. This elevation, *45* [forty-five] years ago, when I first saw it, was the most picturesque spot on *the* Saginaw river. Here was also a beautiful spring of cold water, and was a favorite camping ground of the Indians; it was also, according to the Indian tradition, the original site of the Sauk village, and where the great battle was fought when the Chippewas exterminated that nation.[3]

William McCormick[4] states that "the main village of the Sauks stood on the west side of the Saginaw river, just below where the residence of Mr Frank Fitzhugh now is, and opposite the mill of the Hon. N. B. Bradley." He further states[1] that on the west side of the river the main village of the Sauks was located, across the river from another village (the Portsmouth village site) " which stood near where the court-house now stands, near the ferry, in Portsmouth."

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[1] Thomas, *Catalogue*, p. 107.

[2] *Hist. Sag. Co.*, p. 286, ¶ 2. McCormick, "Mounds," p. 382, ¶ 3.

[3] See footnote 2, p. 287, *American Anthropologist*, 1901.

[4] *Hist. Sag. Co.*, p. 117, ¶ 3.

Portsmouth Village Site. — William McCormick[2] states that, across the river from the main village of the Sauk, there was " another village, which stood near where the court-house now stands, near the ferry, in Portsmouth."

West Bay City Mound.—On August 28, 1890, Mr W. R. McCormick informed the writer that on the west side of Saginaw river, near Peter Smith's mill, in the first ward of West Bay City, there was a very high sacrificial mound of conical form.

Sagenong Village Site. — William McCormick,[3] referring to Skull island, states that " just below this locality . . . lies Sag-e-nong, upon a high bank on the west side of the river. This is the Saginaw of the red man, and the only place known to him by that name. The meaning of the word is the 'land of Sauks.' The place known to the white men as Saginaw lies 12 miles or more up the river, and is called Ka-pay-shaw-wink."

Skull Island Graves. — William McCormick[4] relates that " Skull Island, which is the next island above what is now Stone's Island . . . [is] known as 'Skull Island,' from the number of skulls found on it." He further relates[5] that " about 12 miles below Saginaw City is 'Skull Island,' so named by the Indians in consideration that upon it exists an endless quantity of 'dead heads,' which were left here after a great fight, years long past, between the Chippewas and Sauks, . . . christening . . . about two acres of Bad Island." The approximate date is given:[6] " 1520—Massacre of the Sauks by the Otchipwes." The writer has found no place named " Bad Island " or " Skull Island " on any map and suspects that the former term, at least, was used descriptively in that instance only and was perpetuated by typographic error in capitalization.

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[1] *Hist. Sag. Co.*, p. 118.

[2] *Ibid.*, p. 118.

[3] *Ibid.*, p. 120, ¶ 2.

[4] *Ibid.*, p. 118.

[5] *Ibid.*, p. 120, ¶ 2.

[6] *Ibid.*, p. 474.

Syuaconning Creek. — The " Map of Saginaw and Tuscola, with part of Genesee, Lapeer, Huron & Midland Counties. Michigan,"[1] gives the name Syuaconning to the creek given on the map accompanying the History of Saginaw County as Syaaquanning creek. The History (p. 289) also refers to it as " Squa-hawning, or Last Battle river," and it states (p. 290) that " Squahauning creek (south branch) rises in the township of Kotchville, and flowing northeasterly enters the Saginaw river about six miles from the mouth."

Cheboyganine Creek.—The History of Saginaw County (p. 289) gives the name of this creek as " Che-boy-gun " and states (p. 290) that " Cheboy creek rises in Tuscola county, and flowing in a northwesterly direction, through the townships of Blumfield, Buena Vista and Zilwaukee, enters the Saginaw above Bay City."

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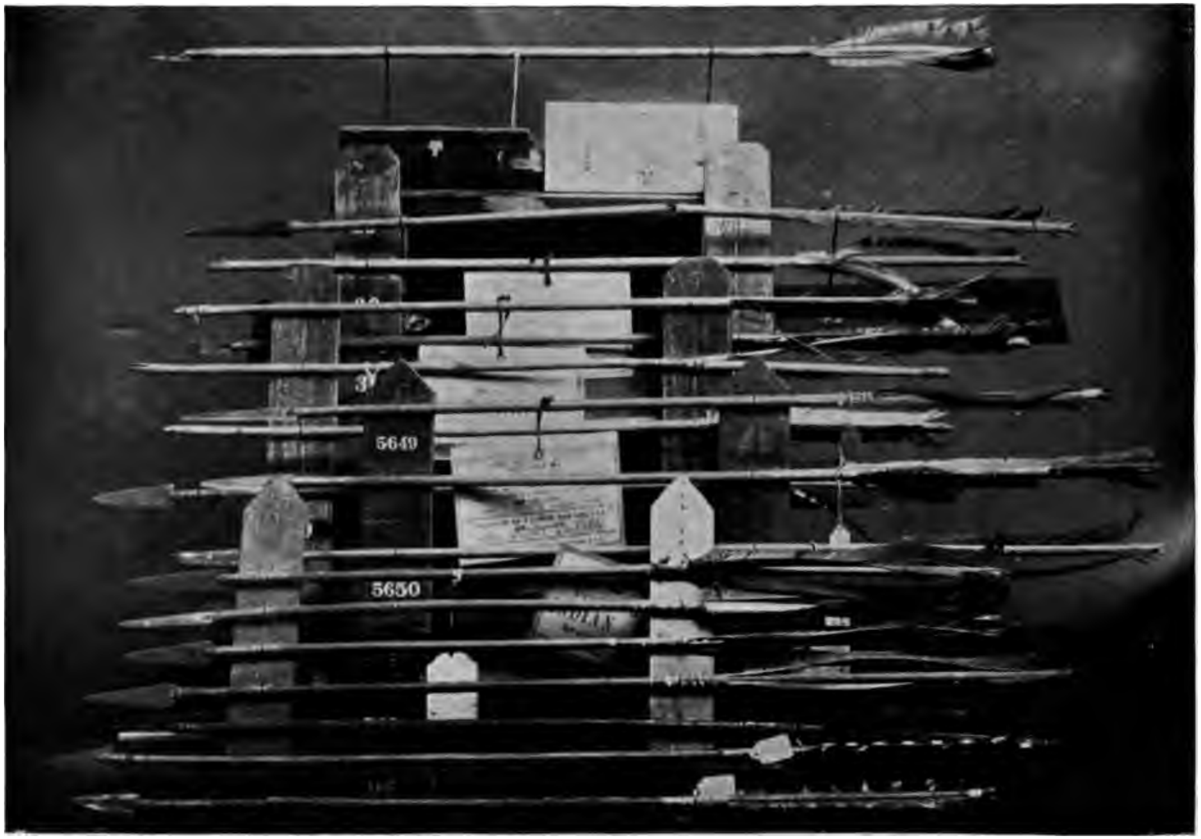
[1] Published by D. A. Pettibone. Bridgeport Center, Michigan. Lythographed printed and mounted by J. H. Colton & Co. New York. Copyrighted 1858.



INDIAN ARROWS USED IN ACTUAL WARFARE; MOSTLY REMOVED FROM WOUNDS BY OPERATING SURGEONS. (ARMY MEDICAL MUSEUM).

ARROW WOUNDS

By THOMAS WILSON

Baron Percy, the author of the *Manuel du Chirurgien d'Armée*, declared that military surgery had its origin in the treatment of wounds inflicted by arrows and spears, and in proof thereof he quoted from ancient classics[1] and cited Chiron's and Machaon's patients, Menelaus and Philoctetes, and Eurypyles treated by Patroclus. He believed the name "medicus" in the Greek anciently signified "sagitta," an arrow,[2] and declared that Hippocrates used a particular forceps, "belulcum," for extracting arrows, which his successor, Diocles, improved and called "graphiscos."[3] Heras of Cappadocia, in the wars of Augustus, invented the duck-bill forceps. Celsus[4] taught the necessity of dilating the wound in order to extract the arrowpoint, and Paulus Ægineta[5] treated arrow wounds in a peculiarly successful manner.

Baron Percy, who thus showed his knowledge of classic medical literature, supposed he had discovered the origin of surgery and was dealing with the earliest wounds made by man with the machinery of war; but the scientific discovery, during the nineteenth century, of prehistoric man, and the repeated findings of graves and cemeteries belonging to the Neolithic and Bronze ages, with their thousands of skeletons—many of them with wounds and fractures—have completely overturned Baron Percy's theory regarding the earliest human wounds and the origin of surgery.

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[1] Homer, *Iliad*, book XI.

[2] Sextus, *Advers. Math.*, book I, chap. 2.

[3] *Andrea della Croce*, book VII, p. 173.

[4] *De Medicina*, book VII, chap. 5.

[5] *De re Medica*, book VI, chap. 88.

We know how the ages of Stone and Bronze had passed away prior to the beginning of history, and how the world was left without knowledge of their existence. Arrowpoints of stone were used by thousands in times of antiquity, but those known to the history of civilization were of iron or bronze; none were of stone. In the army of Xerxes only one tribe—blacks from the interior of Africa—had arrows tipped with stone; the age of stone arrowpoints or spearheads had passed away before the time of Xerxes. All this shows how mistaken was the author of the *Manuel du Chirurgien d'Armée* in his opinion concerning the origin of surgery and the dates of the earliest wounds made by man's weapons.

It has been thought by many persons, among them those qualified to judge, that no burials were made during the Paleolithic period in western Europe. Whether this be true or not it must be admitted that, because of the rarity of the burials or the length of time which has elapsed,—or possibly because of the failure to discover the graves,—comparatively few osseous remains of Paleolithic man have been found. This would satisfactorily account for the few evidences of wounds that have been observed.

The skeletons from the cave at Cro-Magnon show indications of wounds. The femur of the man has been broken, while the forehead of the woman who lay beside him bears a large gash, made apparently with a hatchet. Broca,[1] who examined these specimens, is of opinion that the latter bore traces of suppuration and evidences of healing. Dr Hamy reports many of the bones in the cavern at Sordes as having curious wounds—one a gaping wound in the right parietal of a woman who, like the one of Cro-Magnon, must have survived the injury for some time. Pieces of bone had been removed and there was evidence of healing.[2]

Whether these caves and the burials found therein belonged to the Paleolithic period may be left undetermined so far as concerns the present investigation; but we will see that in the Neolithic period such wounds, made sometimes by hatchets or by blows from other weapons, and sometimes by thrusts received from arrows or spears, were found in considerable number.

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[1] *Les Ossements des Eyzies*, Paris, 1868.

[2] Lartet and Chaplain-Duparc, *Une Sepulture des Anciens Troglodytes des Pyrenées.*

The late Dr Prunières, of Marvajols (Lozère), France, surgeon, anatomist, and early student of prehistoric archeology, conducted many original excavations into the dolmens, tumuli, and burial-places of his neighborhood, and before his death possessed a large collection of objects pertaining to prehistoric man in that section. He took special care to search for and to preserve all specimens relating to physical anthropology, especially those showing skeletal peculiarities. The following is a partial list of objects in his collection relating to arrow wounds:

The superior portion of a tibia, with a deep and suppurated wound, in which is still embedded a flint arrowpoint.

Fragment of the iliac bone, in the internal part of which is embedded an arrowpoint of flint in a wound which shows signs of suppuration.

Another fragment of iliac bone, in the external part of which was embedded an arrowpoint of flint in a suppurated wound.

A dorsal vertebra with a flint arrowpoint in a wound in the body of the vertebra—no suppuration.

Lumbar vertebra with a wound which has been much enlarged by suppuration and having an arrowpoint embedded in it.

A vertebra with an arrowpoint buried in the body.

A vertebra with an arrowpoint buried in the wound.

An astragalus with an arrowpoint in the wound.

The caverns of Baumes-Chaudes and L'Homme Mort were charnel-houses of Neolithic times, each containing about three hundred skeletons capable of identification. It was out of this wealth of material that Dr Prunières was able to obtain such a large number of peculiar specimens.

The anthropologists of France have always realized the importance of examining and preserving early pathologic or traumatic specimens, and many, especially De Mortillet, Cartailhac, Nadaillac, de Baye, Hamy, and Capitan, have reported specimens bearing evidence of arrow wounds.

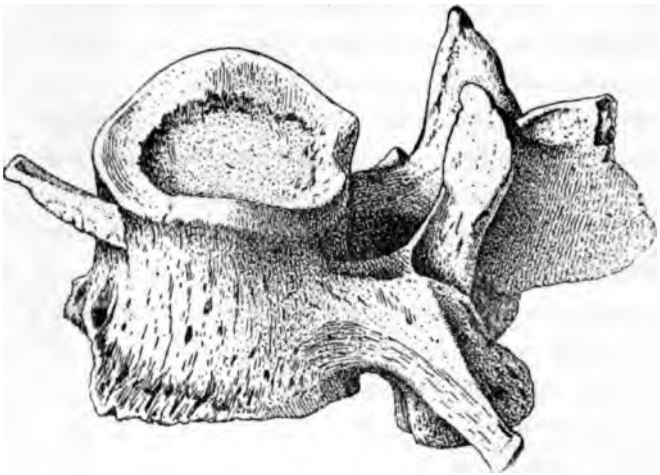

FIG. 59—Prehistoric human vertebra pierced by flint arrowpoint. (Cartailhac, *La France Préhistorique*, p. 254, fig. 124.)

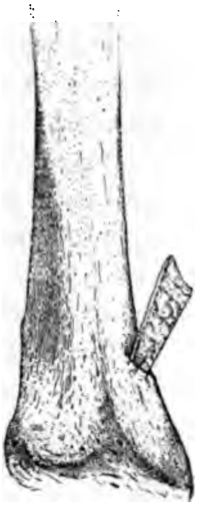

FIG. 60—Prehistoric human tibia pierced by flintarrowpoint. France.

Fig. 59 represents a human vertebra pierced by an arrowpoint, *tranchant transversal*, from the cavern of Pierre-Michelot (Marne), collected by Baron de Baye. Fig. 60 illustrates a human tibia penetrated by an arrowpoint, found in the dolmen of Font Rial near Saint Affrique (Aveyron). Next to Dr Prunières, Baron de Baye has been one of the most successful seekers for such specimens. In the cavern of Villevenard he found one skull containing three *tranchant transversal* arrowpoints, while another was lodged between the dorsal vertebræ. Other human vertebræ pierced with flint arrowpoints were found in the caves of Petit-Morin. In one sepulchral cavern the Baron found seventy-three flint arrowpoints, and, as in the case of Villevenard, their position was such as to lead to the supposition that they had been embed in the flesh at the time of interment and had fallen down as decomposition progressed. A human vertebra was found by M. Cartailhac in the covered way of Castellet, near Arles, with a stone arrowpoint incrusted therein. The absence of any exostosis shows that death quickly followed.

Another human vertebra pierced by an arrowpoint, which appears to have passed entirely through the body, was found in the cavern of La Tourasse near Saint-Martory, Haute Garonne, and has been described by M. Émile Cartailhac.[1] The archeological museum of the Jardin des Plantes, under Dr E. Hamy, contains a number of specimens of human and animal bones penetrated by arrowpoints. By noting the prehistoric specimens alone, the list might be considerably enlarged; but enough has been presented to show the general use of arrows and spears in deadly contests during prehistoric times.

The skull of an ancient Indian man of advanced age, originally received by the Smithsonian Institution from Dr C. Yates, of Alameda county, California, and transferred to the Army Medical Museum, exhibits a wound made by a long flint arrowpoint which penetrated the left orbit (fig. 61). The arrowpoint illustrated belongs to the class usually called perforators, or drills, but in this instance it was used as an arrowpoint.

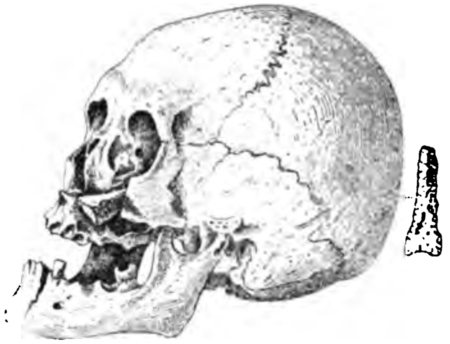

FIG. 61 — Ancient skull pierced by a flint arrowpoint (perforator). California. (Army Med. Mus., cat. 5531.)

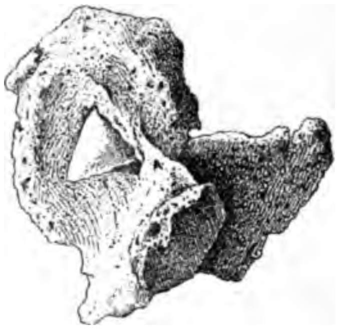

FIG. 62—Ancient human vertebra pierced by a quartz arrowpoint; healed. (Army Med. Mus., cat. 5553.)

Fig. 62 also shows a prehistoric specimen unearthed in 1869 from an Indian mound in the vicinity of Fort Wadsworth, Dakota, by Surgeon A. T. Comfort, U. S. A. It consists of a human lumbar vertebra with a small arrowpoint of white quartz incrusted in it. The vertebra is covered with a new bony formation, showing that the wounded man survived the injury for some months at least.

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[1] *L'Anthropologie*, VII, p. 3, 1896.

An ancient aboriginal skull from Henderson county, Illinois, contributed to the National Museum by M. Tandy, is shown in fig. 63. It had a hole in the squamosal bone on the left side, inserted in which, when found and received by the museum, was a stone arrowpoint also of the perforator or drill type.

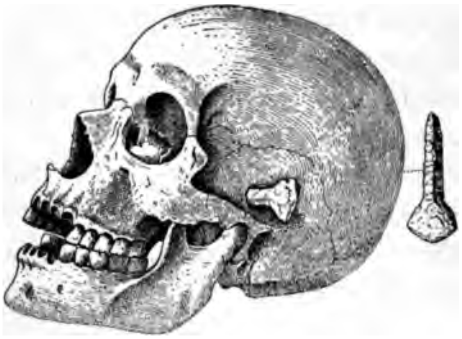

FIG. 63—Ancient skull pierced by perforator arrowpoint. Illinois. (U. S. Nat. Mus., cat. 60281, 60282.)

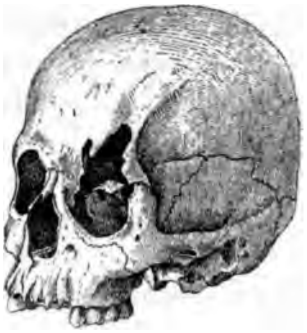

FIG. 64—Arrow wound over left orbit of ancient skull; entirely healed. Missouri. (U. S. Nat. Mus., cat. 173995.)

A human skull from a mound in Missouri is represented in fig. 64. The subject had received a serious wound in the left supraorbital arch, which involved the bones of the interior arch, causing it to break down; but the wound had entirely healed, the cicatrization was complete, and all the wasted or destroyed pieces of bone around the wound had sloughed off and reparation of the edges had taken place. Of course the missile which penetrated the skull did not remain in the wound, and was not found, but from its superficial smallness and its depth there is no doubt that the wound was made by an arrowpoint.

Two specimens of prehistoric flint arrowpoints or spearheads found inserted in human bones are represented in plate XVII. These specimens were sent to the National Museum by Dr John E. Younglove, of Bowling Green, Kentucky. No. 1 shows an implement 3½ inches long, 1⅝ inch wide, and ¼ of an inch thick. The stem is broken, which shortens it considerably. It had pierced the pelvic bone. No. 2 is 4 inches long, 1⅝ inch wide, and ¼ of an inch thick, and is inserted in the head of a human femur (?). No. 1 is loose, so that it may readily be taken out of its present socket; but No. 2 is firmly embedded. The material of both points is the black or brown lusterless pyromachic flint common to the country in which it was found. The specimens came from a cavern about four miles northeast of Bowling Green, and an equal distance from Old Station. The opening of the cave was about 3 feet in diameter and the hole about 40 feet in depth. At its bottom the cave extended horizontally several hundred feet through apparently solid rock.

Most of the specimens of arrows and arrow wounds in the Army Medical Museum pertain to modern Indian warfare. The arrowpoints of iron or steel show, by actual experience and ocular demonstration, the effect of these projectiles upon bones, the endurance of the patient, and the skill of the surgeon; consequently they are of considerable interest. They also show that none of the arrowpoints were poisoned.

Fig. 65 illustrates an arrow wound which was treated by W. M. Notson, Assistant Surgeon, U. S. A. An attack was made by Indians near Pecos river, Texas, September 1, 1870, in which one man was killed, one escaped, and the patient received an arrow wound in the head and three gunshot flesh-wounds. Seven days later he was admitted to the hospital at Fort Concho, Texas, having traveled part of the distance on foot. He complained of

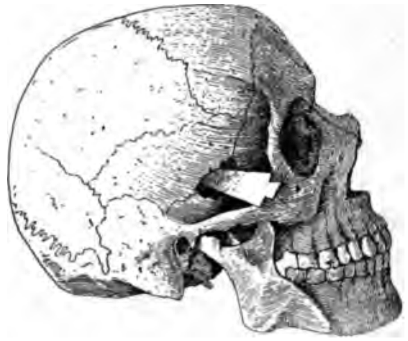

FIG. 65—Skull of a white man pierced by arrowpoint in Indian fight near Pecos river, Texas, 1870. (Army Med. Mus., cat. 5907.)

soreness from the gunshot wounds, but spoke lightly of the "scratch" made by the arrow on the side of his head. The gunshot wounds healed, but cerebral complications developed. An effort was made to reopen the wound in the temple, which proved unsuccessful on account of the resistance of the temporal facia, and doubt as to the cause of the existing symptoms prevented the surgeon from making a free incision. The case terminated fatally September 19, and the autopsy revealed the real injury to have been caused by the entry of the iron arrowhead half an inch from the external incision.

Fig. 66 represents the case of Martin W——, of Co. E, 4th Cavalry. He was on duty as one of the mail-stage guards from Fort Chadbourne. About twenty miles from Fort Concho, Texas, the stage was attacked by a band of Comanche. This soldier was wounded by an iron-headed arrow, which entered the squamous portion of the left temporal bone and penetrated the left cerebral hemisphere to the depth of an inch or more, causing intracranial bleeding, which was speedily fatal. The puncture of the thin calvaria without fissuring is well indicated; internally there is no splintering. The vitreous table is as cleanly divided as is the outer table.

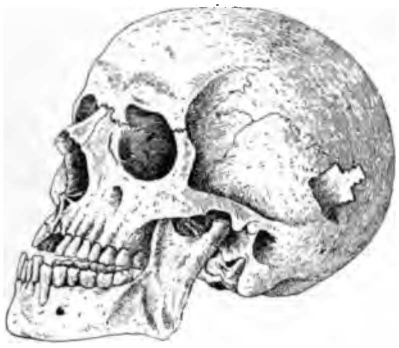

FIG. 66—Skull of United States cavalryman pierced by iron arrowhead by band of Comanche, near Fort Concho, Texas. (Army Med. Mus., cat. 5908.)

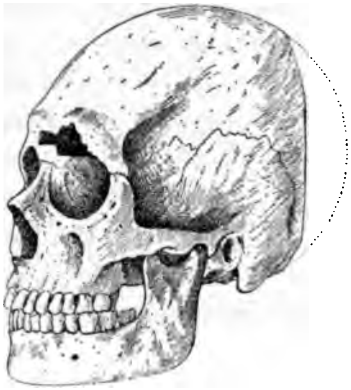

FIG. 67—Skull of a Mexican killed in Indian fight 75 miles northwest of Fort Concho, Texas, 1868. (Army Med. Mus., cat. 5644.)

Fig. 67 represents the skull of a Mexican killed by an arrow in an Indian fight seventy-five miles northwest of Fort Concho, Texas, February 22, 1868. He was treated by W. M. Notson, Assistant Surgeon, U. S. A., who reported:

> When I opened the skull I found an incision extending clear across the opposite hemisphere, touching the dura mater just above the tentorium. The dura mater was stained, but I could find no mark on the, skull. When I made the post mortem I found the arrowhead in the brain. When the patient was hit, he seized the arrowshaft with both hands and pulled it out, then dropped and remained unconscious until he died, about six hours after.

Private John Krumholz, Co. H, 22d Infantry, was wounded at Fort Sully, South Dakota, June 3, 1869, by an arrow which entering at the outer canthus of the left eye, penetrated the skull two inches, and is supposed to have passed between the skull and the dura mater. The operation for extraction, which was immediately performed, consisted in sawing nearly through the skull with a Hey's saw, in close proximity to the arrow. Recovery was rapid, the soldier returning to duty June 7 (?).

The iron arrowpoint shown in plate XVIII, *d*, represents a very interesting case. Private Snowden, 14th Infantry, was one of a party surprised by Apaches, March 22, 1866, while en route from Maricopa Wells to Fort Goodwin, Arizona. He was struck in the back of the head by an arrow, which penetrated the skull, and nine days later reached Maricopa Wells, weak and fatigued, but unimpaired in intelligence. He believed the arrowpoint to be within the cranium, since, in pulling on the shaft after receiving the injury, nothing but the shaft responded. The usual treatment was being given with success, when in examining the scalp there was discovered a small tumefaction over the parietal side of the left occipito-parietal suture. Pressure caused the issue of a small quantity of serous matter from the cicatrix of the arrow wound. This was enlarged, and a probe passed into it was made to feel along the fissure in the bone, when it struck something metallic. The cranium was laid bare by a crucial incision, and with considerable difficulty a hoop-iron arrowhead 1⅜ inch long and ½ inch in breadth was withdrawn from the brain. About a dram of pus followed it. After the operation the right side of the body was observed to be paralyzed. The patient's condition fluctuated, but the first week in May his improvement had been such as to cause belief in his ultimate recovery. On the 7th he ate something which disagreed with him and gradually grew worse until the morning of the 13th when death ensued. The post mortem showed that the brain tissue to the extent of three-fourths of an inch around the track of the arrowpoint was softened and disorganized.

Private William Drum, 14th Infantry, was wounded in a fight with Apaches, November 11, 1867. One arrow entered over the malar bone of the left side of the face, and passed along the lower border of the orbit to within half an inch of the nose. Another arrow entered through the tendons of the latissimus dorsi muscle on the right side and passed directly backward toward the spine under the deep muscles, penetrating 2½ inches. On the 19th the arrowpoint was cut out, the parts healed by first intention, and on December 3 the patient was returned to duty.

John Fenske, a civilian, aged 19 years, came to Fort Ridgely, Minnesota, on the night of August 20, 1862. He had been wounded on the previous day by an Indian arrow, shot from a distance of about twelve feet, which had entered horizontally between the third and fourth ribs on the left side, close to the vertebræ. The arrow—a barbed one with a head about three inches long—was buried an inch below the surface of the skin and had penetrated the left lung. On account of the barbs, it became necessary to make a large perpendicular incision in order to remove the arrowhead, which required considerable pulling, the sharp edges having been wedged in between the ribs with such force as to bend them over on each side. After dressing and the usual treatment, a healthy suppuration ensued, and the wound closed by granulation in thirteen days. The surgeon reported that " it was evident in this case that the arrow had penetrated the lung," which diagnosis was fully corroborated by the objective as well as the subjective symptoms. The patient left the hospital for his home, September 30, 1862, forty-two days after receiving the injury. The surgeon met this patient four years after and found the pleural symptoms considerably ameliorated.

Private Hardwick, 14th Infantry, was wounded in an engagement with Indians near Bower's ranch, Arizona, November 11, 1867. One arrow penetrated the rectus femoris muscle at the center and passed upward and inward to the bone; another arrow entered the center of the belly of the biceps cruris muscle and penetrated to the bone. The surgeon operated upon him on the field, enlarged the wound of the thigh, and removed the arrow. The patient was sent to Camp Whipple; on December 15 both wounds had healed, on the 28th he was able to walk on crutches, and in January he returned to duty.

Surgeon J. H. Bill[1] remarks on the rapidity with which the American Indians discharge their arrows, stating that an individual receiving one wound is almost sure to receive others, and the records of the surgeons tend to substantiate his assertion. Private Imbler, 31st Infantry, while within a few hundred yards from camp at Fort Stevenson, Dakota, October 10, 1867, received three severe wounds from Indian arrows. One of the arrowpoints entered above the left scapula, transfixed the left posterior triangle of the neck, and was extracted at the angle of the jaw; a second passed through the fleshy portion of the right forearm; a third pierced the ulnar side of the left forearm near the elbow. The last was the most serious wound; the distorted head of the arrow was extracted near the wrist, and, save for partial paralysis of the left hand, the patient speedily recovered.

Private Nix, 14th Infantry, was wounded near Camp Lincoln, Arizona, in October, 1868. He received a gunshot flesh-wound in the upper portion of the left arm, a cut from an arrow in the left ear, two flesh wounds from arrows (from which the hemorrhage was profuse), two arrow wounds in the right knee, one gunshot wound in the right elbow and another through the right hand. He was conveyed to camp, riding part of the time on a horse with a comrade, during which time, eight hours, he became very weak from loss of blood and died the next morning.

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[1] *American Journal of Medical Sciences*, XLIV, p. 365.

Nat Crabtree, a citizen of Montana, while searching for cattle, April 24, 1868, received nine arrow wounds. He was conveyed to Camp Cook. Some of the arrows had been removed by his friends, but five, one of which had penetrated 10½ inches, were taken out at the post. The man died a few hours after admission.

A remarkable case of arrow wounds was that of Private Osborn, 2d Nebraska Cavalry, wounded in a skirmish with Indians near Pawnee Reserve, Nebraska, June 23, 1863. Eight arrows entered different parts of his body, and all were extracted except the head of one which had entered at the outer and lower margin of the right scapula and passed upward and inward through the upper lobe of the right lung or trachea. The hemorrhage was so severe that all hope of his recovery was abandoned. The patient, however, rallied, but continued to suffer great pain on swallowing or coughing, and occasionally spat blood. In July, 1866, more than three years afterward, he called upon Dr J. H. Peabody to be examined for a pension. Upon probing through a small fistulous opening just above the superior end of the sternum, the point of the arrow was found resting against the bone about an inch and a half below, the head lying flat against the trachea and esophagus, with the carotid artery, jugular vein, and nerves overlying it. After some difficulty the point of the arrow was raised above the sternum and it was extracted without the loss of an ounce of blood, the edge grating against the sheath of the innominata artery during the operation. His health underwent a remarkable improvement, and the operator, in January, 1869, reported him perfectly well. His pension was not allowed.

Private Spillman, 7th Cavalry, was wounded June 12, 1867, about a mile from Fort Dodge, Kansas, by a party of Kiowa who made a dash upon the herd of horses he was guarding. He received three arrow wounds—one in the right shoulder; one in the right side, striking the rib; and a third through the right lumbar region, penetrating the abdominal cavity eight inches or more. The last-mentioned wound was enlarged, two fingers were inserted on each side of the shaft until the base of the iron head was reached, the fingers serving as a guide and protection when, traction being made, the arrow was withdrawn. The wound proved mortal.

Private Livingston, 3d Cavalry, was wounded, October 6, 1866, at Fort Stevens, Colorado. An arrow entered the right side of the thorax between the first and second ribs. He pulled it out immediately, stating that a great gush of blood followed. He was conveyed in an ambulance over a rough mountain road to Fort Garland, Colorado, where he arrived on the 12th in a weak condition and suffering from dyspnœa. He was successfully treated and returned to duty in the following February.

In February, 1868, an arrow with an iron head, shot by a Dakota Indian, entered the body of John Locke, sutler's employee, three inches to the right of the fifth lumbar vertebra. The arrowpoint came out two inches below the ensiform cartilage. The arrowshaft was withdrawn by cutting it in two and drawing the anterior half out of the anterior opening, the posterior half out of the posterior opening. The patient lost about eight ounces of blood at the time, and a small quantity internally during the evening following the injury; he was confined to bed about two weeks, had much irritative fever and circumscribed peritonitis. Four weeks afterward he was walking about, and was able to attend to his duties by July 1. He was attended by Surgeon C. E. Goddard, of Fort Rice, Dakota.

The records made by army surgeons, as well as specimens exhibiting arrow wounds in the Army Medical Museum, testify to the wonderful endurance of the subjects, and combine surgical interest with the long story of Indian warfare.

To-Kah K-ten, or "He-that-kills-his-enemy," an Indian scout at Fort Buford, Dakota, received, January 3, 1870, an arrow-wound in the pelvis and abdomen. The projectile entered from behind and ranged upward; the shaft, which penetrated twelve inches, was pulled out by the patient, but the head, which penetrated three inches deeper, remained in the wound. The case received surgical treatment and progressed favorably until peritonitis supervened, and death ensued on January 18.

Corporal Monaghan, Co. C, 31st Infantry, was wounded in an Indian skirmish near Fort Buford, Dakota, November 6, 1867, by an arrow which entered below the inferior angle of the right scapula, and, passing around the ribs, came to the front. He walked two miles to the hospital with the arrow sticking in him. An incision was made and the arrowpoint extracted two inches above and a little to the outside of the right nipple, while the shaft was drawn back and removed through the wound of entrance. By November 26 both wounds had healed and the patient returned to duty.

Fig. 68 represents an interesting case of arrow wound, the history of which is as follows:

Satamore (Set-emâ'-i), a wild Indian, chief of the Kiowa, in 1862 led his tribe in war against the Pawnee, and engaged in a fight with them near Fort Larned, Kansas. He was on horseback, and coming to close quarters, threw himself to the opposite side of his horse after the manner of Indians. A Pawnee on foot, and within a few paces, fired from behind an arrow which, just missing the horse's backbone, entered the Indian's buttock. The shaft was withdrawn, leaving the iron arrowpoint in his body. He passed bloody urine, but the wound soon healed, and in a few weeks he was able to go on the hunt for buffalo without inconvenience. For more than six years he continued at the head of his band, leading it in all its travels and adventures or the chase. The presence of the arrowpoint troubling him, in August, 1869, he applied to Assistant-Surgeon W. H. Forwood, U. S. A., at Fort Sill, and revealed what to the Indian was regarded as a deep secret. A surgical examination revealed a vesical calculus. The operation of lithotomy was performed with the assistance of Assistant-Surgeon Kilbourne, U. S. A., the calculus was removed, and on being sawed in two revealed the presence of the arrowpoint as its nucleus. The figure shows the calculus with the arrowpoint still in it. Its weight was eight hundred and fifteen grains and consisted of an almost uniform deposit of triple phosphates.

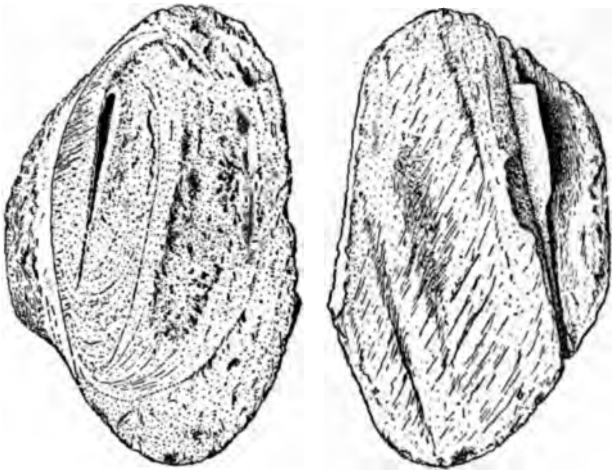

FIG. 68—Calculus containing iron arrowhead, taken from bladder of the Indian chief "Satamore," seven years after wound. Natural size. (Army Med. Mus., cat. 5931.)

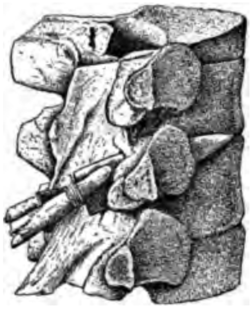

FIG. 69—Human vertebræ containing iron arrowhead. Subject killed in Indian fight near Fort Concho, Texas, 1869. (Army Med. Mus., cat. 5673.)

Fig. 69 shows an iron arrowpoint impacted in the right transverse process of the fourth dorsal vertebra and posterior extremity of the rib. It was taken from the body of a white man who was killed by Indians, in 1869, near Fort Concho, Texas. The post mortem developed not fewer than four arrowpoints in his lungs and heart.

Fig. 70 represents the point of an iron, or apparently steel, arrow- or knife-point which has been shot or thrust into the thoracic vertebra, passing directly into the spinal cord, producing instant death.

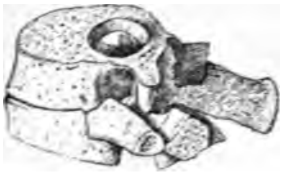

Fig. 70—Thoracic vertebra with iron arrow- or knife-point passed directly into spinal cord, resulting in instant death. (Army Med. Mus., cat. 9246.)

Fig. 71 shows a specimen of buffalo-rib with a transfixed arrowpoint and the broken arrowshaft by its side. The penetration and binding of the arrowpoint emphasize the force with which it was shot from the bow.

Many stories are told in regard to the force of arrows shot by Indian bowmen. It is said that an arrow has been driven through a buffalo or horse when not intercepted by a bone. A specimen is reported in the Army Medical Museum with the arrowpoint transfixed in the scapula, *from the interior;* that is, after having passed through the body of the animal.

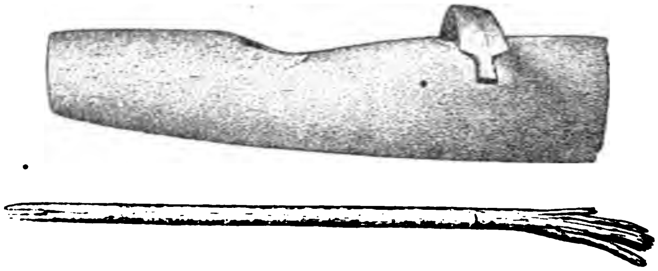

FIG. 71—Buffalo rib with transfixed iron arrowhead; broken arrowshaft by its side. (Army Med. Mus., cat. 7088.)

Plate XVIII, *a*, *b*, *c*, represents portions of the rib and shoulder-blade of buffalo which have been transfixed by arrows fired by Indians in the chase. They were obtained by Prof. Joseph Henry of the Smithsonian Institution, and deposited in the Army Medical Museum. The iron arrowpoints are still in the wounds. The specimens are introduced to illustrate the force with which an arrow can be shot by the bow, and, because of its initial velocity, there is no comminution of the bones. The edges around the wounds are not fractured or fissured on either side; there are n splinters made by the arrow on entering or leaving. This is due to the same principle that a pistol ball fired at short range passes through a pane of glass without shattering it.

A paper by W. Thornton Parker, M.D.,[1] describes the arrow and its mode of manufacture, and magnifies the malignity of arrow wounds. The author explains the apocryphal difference between hunting and war arrows, saying:

> The head of the war arrow is shorter and broader than that of the hunting arrow, and is attached to the shaft at right angles with the slot which fits the bow-string, the object being to allow the arrow in flight more readily to pass between the human ribs, while the head of the hunting arrow, which is long and narrow, is attached perpendicularly to the slot, to allow it to pass readily between the ribs of the running buffalo.

Ashhurst[2] wrote an extensive article on arrow wounds. He takes a favorable view of the curability of arrow wounds, which is borne out by the cases cited, and says:

> Those penetrating the chest and wounding the lung, although serious, are by no means mortal. . . . If the patient survives the hemorrhage, the prognosis is favorable, for the consecutive inflammation is usually trifling and requires no treatment beyond placing the patient at rest and affording a supply of pure warm air.

His table of arrow wounds in the chest shows that out of eighteen cases there were thirteen deaths.

Dr Kilbourne,[3] in an address delivered before the Buffalo Medical Club in 1881, tells of a prominent U. S. Army officer who, while a subaltern, received a wound from a Comanche arrow. He remarks:

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[1] *Medical Times*, Nov. 17, 1883, XIV, pp. 127–129.

[2] *International Encyclopædia of Surgery*, II, p. 116.

[3] *Buffalo Medical and Surgical Journal*, XX, pp. 538–544.

> The weapon pierced the upper part of the right chest and passed nearly horizontally through the lung, the point protruding at the back between the scapula and the spine. He informed me that, at his own request, a silk handkerchief was fastened to the shaft, which was then pushed through his body, dragging the silk after it through the whole extent of the wound. He recovered and served actively in the army for many years after.

Eighty-three cases of arrow wounds, of which twenty-six proved fatal, are reported by the Surgeon-General,[1] U. S. A. Nearly all the fatal cases involved wounds in the three great cavities or in the larger bones or joints.

Plate XIX represents a number of arrows used by Indians in actual warfare. Most of them were removed from wounds by the operating surgeon.

Dr W. Thornton Parker[2] tells of a case of arrow wound under his own (temporary) treatment:

> While passing through the little town of Trinidad, New Mexico [now Colorado], some years ago, I was called to see a man who had received a severe and apparently desperate arrow-wound through the right chest in a skirmish with Indians the day before. The arrow had penetrated quite through the right lung. The head had been detached and the shaft withdrawn. Some hemorrhage had followed, but he had recovered from the shock. I ordered cold water compresses and left Dover's powders with wine for convalescence. Some months after I met the patient in robust health driving a four-horse Rocky Mountain stage with only external marks of his wound remaining. His recovery had been rapid and regular. His lungs appeared sound, judging from the use he was able to make of them in shouting and halloaing.

Surgeon J. H. Bill,[3] U. S. A., describes the apparatus devised by himself and in use by other surgeons for the extraction of arrows. It will be needless to follow these in their details, but the principle is that, using the arrowshaft as a guide by which to find the arrowhead, it shall be snared or seized in some way with a wire or loop or similar device by which the traction can be applied to the arrowpoint, when it, with the shaft attached, can be withdrawn.

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[1] Circular No. 3, August 17, 1891.

[2] *Philadelphia Medical Times*, Nov. 17, 1883, XIV, pp. 127–129.

[3] *American Journal of Medical Sciences*, N. S., XLIV, p. 365.

Dr W. Thornton Parker[1] described the Indian method of removing arrowpoints when imbedded in the wound. He says a willow stick is split, the pith scraped out, and the ends rounded so that they may readily follow the arrow track. The pieces are introduced so as to reach and cover the barbs; they are then adjusted, bound to the arrowshaft, and all withdrawn together.

This brief account of arrow wounds does not pretend to be complete, nor to treat the subject from a surgical or scientific point of view. Those who desire to continue it, either scientifically or historically, may consult the following authorities in addition to those already cited:

DR GROSS. *A System of Surgery*, 4th ed., Philadelphia, 1866, I, p. 361.

Surgeon B. A. CLEMENTS, in Hamilton's *Military Surgery.*

Surgeon J. H. BILL, in *American Journal of Medical Sciences*, N. S., XLIV, p. 365.

Assistant Surgeon ELLIOTT COUES, in *The Medical and Surgical Reporter*, 1866, XIV, p. 321.

Prof. C. A. POPE, in *St. Louis Medical and Surgical Journal*, January, 1864.

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[1] *Medical Times*, op. cit., Nov. 17, 1883, XIV, pp. 127–129.

MEXICAN CODICES: A LIST OF RECENT REPRODUCTIONS

By M. H. SAVILLE

One of the most important sources of information for the study of ancient Mexico is found in the existing pictorial and hieroglyphic codices, or books. As is well known, several of the tribes of Mexico had attained a degree of culture at the time of the Spanish conquest that led to the recording of events of national importance and much that related to their religion, not only on stone bas-reliefs and sculptures, but on material of a more perishable nature.

They made books, which have been generally called codices, on strips of deerskin, the surface of which was covered with a thin coating of stucco. These were folded screen-fashion, and the paintings were on both sides. They had furthermore invented a kind of paper. In Yucatan and the Maya territory this paper was made from the membrane of a tree, and I am tempted to quote from Peter Martyr the description he gives of the books which were seen by him, and of the way in which they were made. He says:

> "They do not bind their books as we do, leaf by leaf, but they extend one single leaf to the length of several cubits, after having pasted a certain number of square leaves one to the other with a bitumen so adhesive that the whole seems to have passed through the hands of the most skilful bookbinder. Whichever way this book was opened, it would always present two sides written and two pages appear, and as many folds, unless you extend the whole of it. . . . The leaves of these books upon which they write are made of the *membrane* of trees, from the substance that grows beneath the upper bark, and which they say is very scarce. It is not like that found in the willows or elms, but such as is found inside of certain edible palm trees, and which, re-

sembling coarse cloth, grows between the intersecting leaves precisely like network. These porous membranes they fill up with bitumen and render them pliable and stretch to whatever form they please, and being made hard again they cover them with a certain kind of *gypsum*."

In Mexico proper, in addition to bark-paper, a paper was made from the leaves of the maguey plant, *Agave Americana*. This paper they also sized with a thin coating of lime. One of the things which impressed Cortés, when he first came in contact with the messengers sent out by Montezuma, was that some of them were busily employed in making paintings of the Spaniards, their costumes, arms, and the different objects of interest, giving to each its appropriate color. These were to convey to Montezuma an idea of the conquerors in picture-writing, and is the first notice we have of its existence in ancient America.

Unfortunately, after the conquest the misdirected zeal of the missionaries resulted in the destruction by fire of the greater number of these old books in order to alienate the natives from their superstitions and beliefs in their pagan gods. In Yucatan nearly one hundred Maya books were burned at Mani by order of Bishop Landa, while in Mexico the treasures of Texcoco, the chief seat of ancient learning in the valley of Mexico, were ruthlessly destroyed by order of Zumarraga, the archbishop.

Shortly after this, however, we learn that on two different occasions the oldest Indians and those understanding most concerning the ancient things were brought together and represented in paintings these things, while others gave an explanation in Nahuatl of these same paintings, and finally the immortal Father Sahagun, without whose work we should know little concerning the religious beliefs of ancient Mexico, translated the Nahuatl text into Spanish, forming at the same time a Nahuatl glossary. Until now only a Spanish translation has been published, made, without doubt, from the codex formerly belonging to the Monastery of Franciscans and today in possession of the Real Academia de Historia in Madrid. The other parts of the work remain unpublished. One of these exists in the Biblioteca del Palacio, Madrid, and the other is in Florence. This work of Sahagun, the prototype of the Codex Telleriano-Remensis, we are happy to say, will shortly be published under the editorial supervision of the learned Mexican scholar, Troncoso. (See note 2 near the end of this paper.)

Another codex which is of great value is called the Mendoza Codex, or Codex Mendocino, which was made in somewhat the same way as the one just referred to, but by order of Viceroy Mendoza for Charles V. The original, on maguey paper, is lost, but a copy on European paper is in the Bodleian Library, Oxford.

These works are similar in their post-Columbian origin to the Codex Telleriano-Remensis, and I have dwelt somewhat on them to emphasize the fact that two classes of codices exist—those made on deerskin and on paper before the discovery of America, and those made shortly after the conquest either on maguey paper or European paper with written explanations of their meaning. They form the key to our knowledge of the old Mexican people. Of this class of codices there are the two before mentioned,—Codex Sahagun and Codex Mendoza,—and in addition there is a valuable unpublished work in Florence shortly to be brought out by the Peabody Museum, to which Troncoso has given the name of Codex Nuttall in honor of the accomplished woman who has been instrumental in its production—Mrs Zelia Nuttall. (See note at the end of this paper.) There is a fragment of a similar work in the National Library at Paris, formerly the property of Goupil, by whom it was presented to the library. It has been published in an inferior manner as an appendix to the work of Duran. There is also in the Paris library the Codex Telleriano-Remensis, and in Rome is preserved the Codex Vaticanus 3738.

Both of these classes of codices, the pre-Columbian and the post-Columbian, contain records of Nahuatl history, including migrations, the succession of chiefs, conquests, and tributes, also the ritual employed by the priests in fortune-telling; the sacred calendar, and records of fixed and movable religious festivals, as well as astronomical material. These works remained practically buried to the world until about sixty years ago when Lord Kingsborough published in his great volumes a few of the codices which had escaped destruction and had found their way from time to time into the libraries and private collections of Europe. The books, however, cannot be studied to the best advantage in Kingsborough, because Aglio, the artist who was employed in copying them, not understanding anything of their contents, in some instances has given the wrong sequence to the pages and in very many cases has given the wrong color to figures. It is also to be noted that since Kingsborough's time a number of hitherto unknown codices have been found. It is desirable that they should be published in their original form; that is, in the case of the greater number of pre-Columbian codices, in long strips, folded screen-fashion and painted on both sides.

It is only during the last fifteen years that an attempt has been make to reproduce these priceless records in exact facsimile, so far as their original form is concerned. In 1892 the first codex appeared in this manner, being the Maya Codex Cortesianus, published in Madrid.

During the last six years a great impetus has been given to the study of these codices by the reproduction of a number of the books which were first brought out by Kingsborough. Students of anthropology, and especially of ancient America, owe a debt of gratitude to the Duke of Loubat for the excellent manner in which he has had these reproductions made and for their generous distribution among the great libraries and museums of the world, whereby they are made practically available for careful investigation and study.

The following list may be useful to the student of ancient Mexican history, and it indicates the increased interest in this branch of American archeology. Nearly all of the more important codices are now within the reach of students, and we may confidently look forward to the clearing up of many obscure points in Mexican mythology, due to the wide distribution of these facsimiles and the ever-increasing activities in the field of American anthropology, both in Europe and in America.

1885

MAPPE TLOTZIN.—A painting, on prepared skin, relating to pre-Columbian Nahuatl history, with explanation written in the Aztec language; in the Aubin-Goupil collection, National Library, Paris. Published in Paris in *Mémoires sur la Peinture Didactique et l'ecriture des Anciens Mexicains*, par Aubin.

MAPPE QUINATZIN.—A painting on maguey paper relating to pre-Columbian Nahuatl history, with explanation written in the Aztec language; in the Aubin-Goupil collection, National Library, Paris. Published in Paris in *Mémoires sur la Peinture Didactique et l'ecriture des Anciens Mexicains*, par Aubin.

1886

LIENZO OF JUCUTACATO.—An ancient painting on native cloth from the district of Uruapan, Michoacan. Published by Dr Nicolas León in the *Smithsonian Report* for 1886, Part I., with a study of its contents.

MAPA DE TEPECHPAN.—A painting, on maguey paper, relating to the history of the Aztecs. In the Aubin-Goupil collection, National Library, Paris. Published without colors, in *Anales* of the Museo Nacional, Mexico, tomo III, entraga II.

1887

CODEX PERESIANUS.—A pre-Columbian Maya codex preserved in the National Library, Paris. Published by Leon de Rosny, with an introduction.

1890

TRIBUTE ROLL OF MONTEZUMA.—A pre-Columbian codex preserved in the Museo Nacional, Mexico. Published by Dr Antonio Peñafiel in *Monumentos del Arte Mexicano Antiguo.* (See note on the "Tribute Roll of Montezuma," published in *Transactions* of the American Philosophical Society.)

CODEX SANCHES SOLIS.—A pre-Columbian codex in possession of Baron Waecker-Gotter in Germany. Published by Dr Antonio Peñafiel in *Monumentos del Arte Mexicano Antiguo.*

LIENZO DE (AMOLTEPEC) YOLOTEPEC.—A pre-Columbian painting on cloth preserved in the American Museum of Natural History, New York. Published by Dr Antonio Peñafiel in *Monumentos del Arte Mexicano Antiguo,* from an inexact tracing.

MEXICAN PICTURE CHRONICLE OF CEMPOALLAN.—A post-Columbian codex, on maguey paper, in possession of Bernard Quaritch, London, and published by him.

1891

DOCUMENTS POUR SERVIR A L'HISTOIRE DU MEXIQUE.—A catalogue of the Aubin–Goupil collection of pre-Columbian and post-Columbian codices and maps. With an atlas of eighty plates of reproductions without colors. Published in Paris under the editorship of Eugéne Boban. This collection is now preserved in the National Library, Paris, and comprises 403 pieces, many of which, however, are manuscripts.

1892

CODEX PORFIRIO DIAZ.—A pre-Columbian codex preserved in the Museo Nacional, Mexico; published in *Antigüedades Mexicanas.*

CODEX BARANDA.—A post-Columbian codex preserved in the Museo Nacional, Mexico; published in *Antigüedades Mexicanas.*

CODEX DEHESA.—A pre-Columbian codex preserved in the Museo Nacional, Mexico; published in *Antigüedades Mexicanas.*

LIENZO DE TLAXCALA.—A post-Columbian series of paintings on cloth; published in *Antigüedades Mexicanas,* from a copy in the Museo Nacional, Mexico. The original is lost.

TRIBUTE ROLL OF MONTEZUMA.—In *Transactions* of the American Philosophical Society, Philadelphia, N. S., vol. XVII, Part ii. Six plates, reproducing paintings on maguey paper preserved in the library of the Society. The first four are fragments of pages from the original Tribute Roll, which is in the Museo Nacional, Mexico. A facsimile of this codex, minus the four leaves, which are supplied from a poor copy on European paper, is published by Dr Peñafiel in his *Monumentos del Arte Mexicano Antiguo,* Berlin, 1890.

CODEX BECKER (MANUSCRIT DU CACIQUE).—Published in Geneva by Henri du Saussure.

CODEX COLOMBINO.—A pre-Columbian codex preserved in the Museo Nacional, Mexico; formerly known as the Codex Doremberg. It is unquestionably a part of the Codex Becker. Published by the Mexican government in *Antigüedades Mexicanas.*

CODEX CORTESIANUS.—A pre-Columbian Maya codex preserved in the Museo Arqueologico Nacional, Madrid. This codex is folded screen-fashion and was the first to be reproduced in this manner in exact facsimile of the original. (It is to be regretted that all of the reproductions in this list are not published in their original form.)

CODEX DRESDENSIS.—A pre-Columbian Maya codex preserved in the Dresden Library. Published by Dr E. Förstemann.

1893

DIE MEXICANISCHEN BILDERHANDSCHRIFTEN ALEXANDER VON HUMBOLDT.—A series of paintings on maguey paper preserved in the Royal Library, Berlin. Published by Dr Eduard Seler with a study, in German, of their contents.

CODEX DE 1576.—A post-Columbian codex in the Aubin-Goupil collection, National Library, Paris. Published by Leroux.

1895

CODEX FERNANDEZ LEAL.—A pre-Columbian codex now in the collection of Mr E. J. Molera, San Francisco. Published in Mexico by Dr Antonio Peñafiel.

1896

CODEX VATICANUS, NO. 3773.—A pre-Columbian codex preserved in the Vatican Library, Rome. Published by the Duke of Loubat, and the first of the superb reproductions which he has so lavishly distributed to libraries and museums.

1897

MANUSCRITO AMERICANO NUM. 4.—A post-Columbian codex preserved in the Royal Library, Berlin. Published in Mexico by Dr Antonio Peñafiel.

1898

MAPA DE CUAUHTLANTZINCO, OR CODEX CAMPOS.—A post-Columbian series of paintings preserved in Cuauhtlantzinco, near Puebla. Published as Bulletin III, Department of Anthropology, University of Chicago, by Prof. Frederick Starr.

CODEX BORGIA.—A pre-Columbian codex preserved in the Ethnographical Museum of the Vatican, Rome. Published by the Duke of Loubat. An exhaustive treatise on this codex was written at the close of the eighteenth century by P. José Lino Fábrega, and was published, with parallel texts in Italian and Spanish, in the *Anales* of the Museo Nacional, Mexico, in 1900.

1899

CODEX BORBONICUS.—A pre-Columbian codex preserved in the library of the Chamber of Deputies, Paris. Published for the first time by the house of Leroux. An exhaustive study of its contents, in Spanish, was published in Florence by Sr Francisco del Paso y Troncoso, Director of the Museo Nacional of Mexico.

CODEX COSPIANO (formerly BOLONIA).—A pre-Columbian codex preserved in the library of the University of Bolonia. Published by the Duke of Loubat.

CODEX TELLERIANO-REMENSIS.—A post-Columbian codex preserved in the National Library, Paris. Published by the Duke of Loubat.

1900

LIENZO DE ZACATEPEC.—A pre-Columbian painting on cloth from the Mixteca, State of Oaxaca. Published in Mexico for the first time by Dr Antonio Peñafiel.

CODEX VATICANUS, NO. 3738 (RIOS).—A post-Columbian codex preserved in the Library of the Vatican, Rome. Published by the Duke of Loubat.

TONALAMATL AUBIN.—A pre-Columbian codex preserved in the National Library, Paris. Published by the Duke of Loubat with an exhaustive study of its contents in German by Dr Ed. Seler. Translated into English and published in London in 1901.

1901

CODEX FEJÉRVÁRY-MAYER.—A pre-Columbian codex preserved in the Free Public Museums, Liverpool. Published by the Duke of Loubat. An exhaustive study of its contents by Professor Seler is now in press. (See page 546 of this magazine.)

PINTURAS JEROGLIFICOS OF THE CHAVERO COLLECTION, PARTS 1 AND 2.—A series of paintings published by Alfredo Chavero in Mexico. The paintings reproduced in the first part should be most carefully studied in order to verify their authenticity.

A magnificent pre-Columbian codex preserved in a private library in England is now in press and is to be published by the

Peabody Museum, Harvard University, with a study of its contents by Mrs Zelia Nuttall, by whom it was discovered.

Two similar works of great value are soon to be published, namely:

(1) A post-Columbian codex preserved in the Biblioteca Nazionale, Florence, bearing the title *Life of the Indians*. It is on European paper, and most of the paintings have explanations in the Spanish language. This will be published by the Peabody Museum, Harvard University, with a study of the work by Mrs Zelia Nuttall.

(2) The Sahagun Codex, a series of post-Columbian paintings accompanying the Nahuatl text of Padre Sahagun's *Historia General de las Cosas de Nueva España*, as yet unpublished, will be reproduced by the Mexican government with a translation of the Nahuatl text by Sr Don Francisco del Paso y Troncoso.

Among the pre-Columbian codices published by Kingsborough, there still remain to be brought out in exact facsimile the following:

1. Original painting, collection of Sir Thomas Bodley; in the Bodleian Library, Oxford. 40 pages.
2. Original painting, Selden collection, Bodleian Library, Oxford. 20 pages.
3. Original painting, Selden collection, Bodleian Library, Oxford. A roll making 12 pages in Kingsborough.
4. Codex Land, Bodleian Library, Oxford. 46 pages.
5. Vienna Codex, in Imperial Library, Vienna. 68 pages.
6. Codex Mendoza, a copy on European paper, Bodleian Library, Oxford.

BOOK REVIEWS

Calendar History of the Kiowa Indians. By JAMES MOONEY. (From the Seventeenth Annual Report of the Bureau of American Ethnology.) Washington: 1898 [1901]. Pages 129–445, plates and figures. Roy. 8°.

This work of over 300 pages is an original contribution of the highest value to ethnography. Its title affords but an imperfect idea of its scope; for, in addition to an elaborate description of the Kiowa calendars, the author gives us, in 106 pages, a sketch of the tribe including its documentary history, a list of western military and trading posts, the most extensive glossary of the Kiowa language yet published, and other items of information which lead to a thorough understanding of the calendars.

It is understood that this work is but one of a series on the Kiowa which the author contemplates publishing. If he lives to complete his task—which there is every prospect of his doing, as he is yet a young man—the small and rather backward tribe of the Kiowa will be better represented in scientific literature than any other within our borders.

The pictorial calendars which Mr Mooney describes have many characteristics in common with the Dakota calendars published in previous reports of the Bureau of Ethnology. They do not cover so long a period of time as the Dakota calendar of Lone-dog,—the latter includes seventy-one years, while the Kiowa calendars include but sixty,—yet the Kiowa records are in one respect much the superior, as they give two historic items for each year, instead of one like the Dakota records. They show a summer event and a winter event. As our year begins in winter it is often difficult or impossible to tell in which year, according to our reckoning, the event symbolized in the calendar occurred; but there need be no doubt about the summer events of the Kiowa. There are symbols to indicate the season.

In addition to the four annual calendars described, there is a monthly calendar covering a period of three years. The author of this calendar, Anko, after giving a copy of his work to Mr Mooney, continued his record, and it will interest the faculty to learn that he made it largely a clinical history of the case of his consumptive wife. So far this is the only monthly calendar discovered among the North American tribes.

It is notable how well these pictorial stories of the Kiowa are often corroborated by our own historical records.

The whole work has been painstakingly performed. It exhibits, like all of the author's works, the results of patient, scholarly research expressed in clear, concise language. It is a mine of valuable information; yet there are a few unimportant points on which we venture to differ with the author, if for no better reason than to air our own knowledge and show that we have actually read the book.

On page 142 the credit for discovering the Lone-dog winter count, which really belongs to Lieutenant Reed, is given to Colonel Mallery. This is merely an oversight on the part of the author. From conversations and correspondence we have had with him, we are aware that, before writing this book, he knew well the history of this "winter count" and probably saw it before Colonel Mallery did. It is not certain that "The tobacco upon the head of the ancient *taime* is another evidence of the northern origin of the Kiowa" (p. 240), since, in prehistoric days Indians of the south and southwest cultivated, or culled in a wild state, different species of *Nicotiana*. It is not probable that the officer who, in 1867–'68, "wore upon his shoulders the eagle or thunderbird" was General Winfield S. Hancock as here stated (p. 321), since the eagle designates the rank of colonel.

The list of "military and trading posts, missions, etc.," has evidently been compiled with great care, yet from our own personal experience, without reference to any authorities, we are able to correct the dates in three cases. The period of military occupancy of Fort Union, Montana, was 1864–65, not 1867 as given in the list. It was our lot to serve with U. S. Volunteers there in 1865 and to come away with them when they abandoned the post. It was never garrisoned by troops after that; but was razed soon after Fort Buford was established in 1866. Fort Berthold, in what is now North Dakota, was first occupied by troops in 1864, not 1865 as given. The list tells us that Fort Pierre, South Dakota, was occupied by troops in 1865–67; but in the former year we saw it in ruins, with little left to mark the site save a few standing chimneys. We know that no troops were even camped in its neighborhood during the years mentioned.

The two excellent maps are very instructive, showing lands and nations known in old days to the Kiowa, and various wanderings of the tribe in their migrations, trading expeditions, friendly visits, and war excursions, on foot and on horseback, before the advent of railroads made long excursions easy. The wanderings cover an area of about 2000 miles from north to south and 1000 from east to west.

The illustrations are numerous and well chosen, and the work is presented in the excellent form characteristic of the publications of the Bureau of American Ethnology. We regret we cannot speak so well of the binding. Handled with care, the book fell to pieces while we were reading it. WASHINGTON MATTHEWS.

String and other Forms of Strand; Basketry-, Woven bag-, and Net-work. By WALTER E. ROTH, B.A., etc., the Northern Protector of Aboriginals, Queensland. North Queensland Ethnography: Bulletin No. 1. Queensland: January, 1901. 15 pp., 19 pl., 4°.

This is a thorough study, in textiles, of savagery, the people being the aboriginals of North Queensland, Australia. The materials used are animal and vegetal—the former being human, opossum, and kangaroo hair; and tendon from kangaroo tail, snake neck, and emu leg. A list of forty-four plants is given, and in each case a careful statement is made concerning the part employed and the technic. The steps in the manufacture of twine, string, chain-work, knotting, plaiting, fringing, winding, joining, lacing, and border-work are clearly described and graphically illustrated by drawings. The Australian twine makers, especially from human hair, put themselves to greater trouble than do the Amerindians. The spindle consists of three parts, the shank, the fluke (seized to the former by wrapping), and the spindle-string, which performs the double function of holding shank and fluke together, and its free end, double, serves as a vise to grip the hair until the twisting is started. This spindle is used not only in strand twisting, but in twining strands afterward. Mr Roth's own classification of basket-work, bag-work, and net-work is as follows:

(A) Made with one continuous strand:
  Basal strand, straight.
    I "Simple loop" pattern.
    II "Loop and twist" pattern.
    III "Hourglass" pattern.
    IV "Netting stitch" pattern.
  Basal strand, circular.
    I "Simple loop" pattern.
    II "Netting stitch" pattern.
(B) Made with two continuous strands:
    No Basal Strand. "Simple loop" pattern.
    One Basal Strand, Circular. "Simple loop" pattern.

Several Basal Strands, Straight. "Chain twist," "Warp and Weft."

(c) Made with One Continuous and One Noncontinuous Strand.

(D) Made with One Noncontinuous Strand.

The author finds the same difficulty as students of Amerindian textiles in separating, for analysis, basketry from bagging, netting, and matting.

Checkerwork, diagonal plaiting, and twined work are to be seen in the plates, but far the greater number of processes are those which remind one of the netted carrying-frames of the Lower Colorado, of Mexico, and especially of Central America. The most startling similarity to Amerindian ware is that between Mr Roth's plate XIV, of dilly-bags belonging to the coastal districts of north Queensland, and the fish-baskets of the Fuegians at the Straits of Magellan. Other similarities to Amerindian work suggest themselves, but drawings would be needed to make them plain. The Home Secretary's Department, Brisbane, has our hearty thanks for the liberal spirit which it has shown to a brother ethnologist on the other side of the world.

O. T. MASON.

Peru: A History of Coca. By W. GOLDEN MORTIMER, M.D. New York: J. H. Vail & Co., 1901.

Under the above title Dr Mortimer has written a book of real scientific value in an unusually attractive style. The principal object of the work is to call attention to the remarkable properties of the "divine plant of the Incas," in order that the world at large may share in the benefits which the native peoples of Peru and neighboring countries have long derived and continue to derive from its use. In furtherance of this object, evidence is produced of the very real and extensive nature of those benefits, and the properties of the plant are carefully distinguished not only from those of the beverage cocoa, made from the roasted seeds of a species of palm, and from the cocoanut, but also from the anesthetic properties of cocaine, an alkaloid of the plant. The very common confusion of coca with these three substances is shown to have formed a barrier to the recognition of its merits. The best conditions and methods of cultivation and the various medicinal uses of the plant are carefully described. The history of coca seems to show that it has been an important element in the advancement of the Peruvian peoples, and it is here that the work becomes of more specific interest to the anthropologist.

In addition to its physical uses, coca played a prominent part in the

Peruvian ritual and mythology, and was naturally regarded with hostile eyes by the early missionaries, but its evident merits triumphed over their opposition. Mama Coca, the mother or "spirit" of coca, was a conspicuous character in the Peruvian pantheon. Incidentally we learn that in Peru today the name Quichua is applied only to the general lauguage of the Indians, while the Indians who speak it are known as Serranos, or Indians of the mountains. Dr Mortimer seems to apply the name Incans to the various peoples of the former dominion of the Incas. The name is a convenient one and historically correct. It is perhaps not an important objection that Inca was a title confined to the ruler, his relatives and descendants, and used to distinguish them from the rest of the people, but some confusion might result from the use of this name in a wider sense.

Several interesting bits of folklore are introduced into the volume, and there is a thoughtfully written description of Peruvian culture. The need of such a book and the value of this one can hardly be questioned. The anthropological material is accurate and interesting. Minor criticisms however, may be made at a few points. The guinea-pig and the llama are said to have been the only domesticated animals of Peru prior to the Conquest. We may question whether the dog must not be added to this list. The llama is said to be in no way related to the camel (p. 218). Aboriginal peoples are said to have been vegetarians (p. 471), contrary to the theory that the hunter preceded the farmer except in those few favored regions where fruits and vegetables grew wild in unusual profusion. STANSBURY HAGAR.

Codex Fejérváry-Mayer. Manuscrit Mexicain Précolumbien des Free Museums de Liverpool. (M 12014) Publié en chromophotographie, par Le Duc de Loubat. Paris: 1901. Text pp. 1–28. Plates, folded screen fashion, 1–44, in colors.

The original codex was formerly in the collection of M. Fejérváry of Budapest and was reproduced in Kingsborough's great work, but the pages are not given in their proper sequence, nor are the colors accurate. It is one of the best preserved and most beautiful of this class of Mexican antiquities, and its whereabouts seem to have been lost to students until six years ago when it was noticed by the reviewer in the back of a basement case in the Liverpool Museum. It was given to the museum by Mr Mayer, who purchased it from M. Fejérváry. The present edition of the Duke of Loubat is in exact facsimile. The original is painted on prepared deerskin sized with a thin white stucco, and not on maguey paper as generally supposed. The pages are about square, measuring 6¾ by 6⅞ inches. It contains two blank pages, forming the covers. The work is issued with a brief introduction by the Duke of Loubat, but an exhaustive study of the codex has been made by the eminent Americanist, Prof. Ed. Seler, of Berlin, which is now in press. This is the seventh of the magnificent reproductions of Mexican codices which the student of American antiquities owes to the liberality and intelligence of this patron of science. They are as follows, with the date of publication annexed:

Codex Vaticanus no. 3773, 1896.
Codex Borgia, 1898.
Codex Cospiano, 1899.
Codex Telleriano-Remensis, 1899.
Codex Vaticanus no. 3738, 1900.
Tonalamatl Aubin, 1900.
Codex Fejérváry-Mayer, 1901.

In addition we should include the Codex Borbonicus, published in 1899, by Leroux, of Paris, through the initiative of the Duke of Loubat who made its publication possible.

M. H. SAVILLE.

Explorations in Alaska, 1899, for an All-American Overland Route from Cook Inlet, Pacific Ocean, to the Yukon. By First Lieut. JOSEPH S. HERRON, 8th Cavalry, Commanding Expedition. (War Department, Adjutant General's Office. No. XXXI, March, 1901.) Washington: Government Printing Office, 1901. 77 pp., illustrations, 2 maps, 8°.

The War Department has recently issued a valuable report of explorations in Alaska in 1899 by Lieutenant Joseph S. Herron, Eighth cavalry, under orders to discover, if possible, and survey a feasible "All-American" overland route from Cook inlet to the gold fields of Cape Nome, and the Yukon. After following one or two side trails sufficiently far to demonstrate their impracticability, Lieutenant Herron struck a main trail in June, and with a party of only five men, followed it perseveringly from the coast, in spite of snows and inclement weather, short rations, and the desertion of their Indian guides, until they arrived, six months later, at the new post of Fort Gibbon on the Yukon. A great part of the country traversed was over a mountainous region never before explored or visited by white men. By the new route it is possible to reach either the Cape Nome or the Klondike gold fields at any season of the year without passing through British territory, while the overland distance is shortened by one-half.

A chapter is devoted to the number, location, and condition of the natives in the territory explored, the physical type and home life being illustrated from photographs. A short vocabulary from the upper Kuskokwim is clearly Athapascan, and we are told that the various tribes encountered on the march, although speaking different dialects, are all cognate. As the Chinook tribe a century ago knew Americans only as "Boston men," so now to these Alaskan tribes the United States is "Seattle." The Lieutenant is to be commended for having preserved upon the accompanying maps the native local names along the route, of a number of which he furnishes the rendering. Full credit is given to the men who contributed to the success of the expedition.

JAMES MOONEY.

The Criminal, his Personnel and Environment. A Scientific Study, by AUGUST DRĂHMS, Resident Chaplain State Prison, San Quentin Prison, San Quentin, California. New York: The Macmillan Company, 1900. xiv, 402 pp. 12°.

This book is a careful study of the physical and moral characteristics of criminals made by a person who has had large experience in dealing with them. It is prefaced with an introduction by Professor Lombroso who states that in this treatise he has found nothing contrary to his own observations and convictions, excepting where the author holds that the American criminal differs in physiognomical type from his European contemporary.

This statement seems rather strange in view of the fact that the author is by no means a dogmatic supporter of the school of physical anthropology which Professor Lombroso represents. On the contrary he repeatedly asserts that he does not believe in the existence of a criminal type associated with definite anatomical characters.

The general reader, for whom the book is written, will find it instructive. It is unfortunate that it is hastily written and that the author has not acquired a literary aptitude in the use of English. It abounds in statistics of anthropometric measurements which, after all, the author does not appear to value highly.

Previous hard training in anatomy would have saved the author from some errors and probably would have led him to exclude some material of doubtful authenticity. How, for example, can we distinctly affirm that "the brains of Descartes and Dante were both sub-microcephalic"? Statistics resemble Mr Weller's veal pies in depending for value largely upon the person who makes them.

FRANK BAKER.

How to Make Baskets. By MARY WHITE. New York: Doubleday, Page & Company, 1901. 194 pp., illustrations, 16°.

This is a little text-book for kindergartens and for home pastime. It lays no claim to be a scientific study, but it is mentioned here with unqualified approbation as showing how the industrial arts and esthetic motives of our Indians are gradually fixing themselves in the fine arts of the civilized. Basketry of the Indians in its materials, artistic elements, technic, mythology, and functions, has been elaborately studied by others; and now Miss White gathers the young about her and proposes to exalt the Indian art and to preserve it by reproducing its processes and patterns in rattan, rafia, rushes, and other materials. Some of the terms used are novel. A warp element is called a "spoke," and a woof element a "weaver." In other cases old and well-established terms are laid aside for new ones. In a second edition there ought to be references to the authors who during the last fifteen years have redeemed the art of basketry from destruction. Chapter xv, by Neltje Blanchan, is devoted to "What the Basket Means to the Indian."

O. T. MASON.

Primitive Man. By DR MORIZ HOERNES. London: 1900. J. M. Dent & Co. 135 pages, 48 figs, 16°.

This neat little volume is one of the Temple Cyclopedic Primers, published at a shilling to provide in a convenient form information which the high-priced encyclopedias place beyond the reach of the average reader. Man's place in nature, characteristics of culture, earliest traces of man, the stone and the metal ages, lake-dwellers, and the earliest Caucasians, form the topics of the chapters. The author is conservative, as he ought to be, in making a summary for popular use of a young and versatile science. There is a poverty of authorities in the bibliography. The only Americans referred to are Brinton (1892), and Dawson (1877, 1887).

O. T. MASON.

PERIODICAL LITERATURE

CONDUCTED BY DR ALEXANDER F. CHAMBERLAIN

GENERAL

Anthony (R.) Le muscle présternal: ses formes fibreuses rudimentaires, leur fréquence chez l'homme et leur présence chez certains animaux. (Bull. et Mém. Soc. d' Anthrop. de Paris, 1900, v^e s., I, 486–514.) Details the results of observations on 52 human subjects (males 30, females 22, of which 11 were fœtuses) and a number of animals. It appears that presternal formations of the kind in question do not occur only in man, but also in the platysternian animals; and in man they are met with at all stages of development. The article is illustrated with 13 text-figures, and a digest of previous investigations precedes the new matter.

Barker (L. F.) On the study of anatomy. (Bull. Johns Hopkins Hosp., Baltimore, 1901, XII, 87–95.) This general discussion, which emphasizes productive study, contains a valuable list of previous addresses on the nature and the subjects of anatomical teaching.

Brown (A. E.) On some points in the phylogeny of the primates. (Proc. Acad. Nat. Sci., Phila., 1901, LIII, 119–125.) The author notes that "the fact that before monkeys, as now known, began to exist, man-like apes were far advanced in development, and that the earliest evidence of existing genera of apes is coëval with that of existing genera of catarrhines, tells enormously in favor of the early and independent origin of anthropomorpha." He also suggests "the multiple rather than the single origin of the *Lemuroidea*."

Brush (C. E.) Notes on cervical ribs. (Bull. Johns Hopkins Hosp., Baltimore, 1901, XII, 114–117.) Brief account of three cases, of which two presented some uncommon variations.

Capitan (L.) Les pierres à cupule. (Rev. de l' École d' Anthrop. d. Paris, 1901, XI, 114–127.) An interesting general discussion, with 13 figures, of "cupped stones" from different parts of the globe, and the various hypotheses relating to their use. Among the theories suggested are: Ornamentation, "idle-work," numeration, amulets, talismans, finger-holes (in case of implements, etc.), miniature bowls, blood-receivers (in sacrifice), polishers, holes used by children for smoothing balls (marbles), etc. The author himself is quite eclectic in his opinion.

Ehrenreich (P.) Wilhelm Wundt's Völker-psychologie. (Globus, Braunschweig, 1900, LXXIX, 21–22.) Critical review and résumé of Wundt's recent work on "Race Psychology," which Dr Ehrenreich thinks may lead to a new era of linguistics. But the American languages, Chinese, etc., have been given none or too little attention in the book.

Gaudry (A.) Sur la similitude des dents de l' homme et de quelques animaux. (Anthropologie, Paris, 1901, XII, 93–102.) This paper, illustrated with 14 figures, discusses the comparative development of the teeth of man and those of certain anthropomorphic apes, fossil and actually existing. The author's conclusion is that, "while with certain animals the complication of the teeth is a mark of progress, with man superiority is indicated by their diminution." Of all teeth considered those of the white race are the most incomplete. Paper read at Congress of 1900.

Giuffrida-Ruggeri (V.) Sui residui della fontanella metopica o medio-frontale. (Riv. di Biol. gen., Torino, 1901, III, 340–342.) Brief critical review of recent literature, with reference to four skulls in the anthropological collection of the University of Rome.

Harrison (R. G.) On the occurrence of tails in man, with a description of the case reported by Dr. Watson. (Bull. Johns Hopkins Hosp., Baltimore, 1901, XII, 96–101.) This paper, illustrated with 6 figures, discusses briefly the general subject, the tail in embryos, etc., with special reference to a tail on a three-months' infant, reported about a year ago by Dr Watson of Baltimore. According to Dr Harrison five cases of "tails" have so far been reported in the United States. The range of estimation of the tail in folk-thought is from the opinion of the Ranas of Poorbunder that the elongation of their spines allied them to the monkey-god, Hanuman, to the views held by their neighbors concerning the "tailed men" of Turkestan, who were held in the greatest contempt.

Höfer (P.) Fortschritte in der Datierung der Steinzeit. (Globus, Braunschweig, 1901, LXXIX, 108–109.) Based on Goetze and Montelius.

Jordan (D. S.) The blood of the nation. (Pop. Sci. Mo., N. Y., 1901, LIX, 129–140.) Continued from previous number. Discusses in popular strain the decay of races through the survival of the unfit in war. Illustrations of thesis from history of ancient empires and of modern America.

Lasch (R.) Die Anfänge des Gewerbestandes. (Ztschr. f. Socialwiss., Berlin, 1901, IV, 73–89.) Seeks to résumé, with references to literature, our present knowledge of the beginnings of industrial classes and special trades and occupations (clothing, pottery, weapons, implements, metal-working, carpentry, etc.) "Home-spun" clothes are well-known among the primitive people of Africa and Polynesia; pottery is very often an art confined (*e. g.*, in New Guinea), to women, or to some special tribe (Nu-Arawaks, *e. g.*, in South America), but sometimes (as with the Northern Bantu in Africa), an art of men,—in parts of Africa, Melanesia, etc., pottery rises to the dignity of an industry for the market; arrow-makers of a special sort occur in many quarters, and the shield-maker among certain Australian tribes touches the point of separate industries; the blacksmith in Africa and the carpenter in Polynesia have a right to consideration as tradesmen, so too the gold and silver worker, the basket-maker, etc. Other callings sometimes restricted to one sex, one portion of the community, one tribe, etc., are tattooing, net-making, house-building, manufacture of household utensils, etc. The author distinguishes the following types of industries: A, House-industry. B, Professional industry (sex-industry, tribe-industry, caste-industry, free, separate industry). The facts in our possession, he thinks, do not allow to dogmatize concerning either the order of evolution of primitive industries or their historical and other relations. In his future investigations Dr Lasch should make use of the studies of Holmes, McGuire, Cushing, Haddon, Mason, *et al.*

Lefébure (E.) L'arc-en-ciel poétique. (Mélusine, Paris, 1901, X, 145–153, 176–186.) Continuation of detailed comparative study of the rainbow in poetry, ancient and modern.

Leggiardi-Laura (C.) Questioni sulle circonvoluzioni cerebrali. (Riv. di Biol. gen., Torino, 1901, III, 304–320.) This article, illustrated with a plate (6 figs.) and four figures in the text, treats of the variation, modes of association, etc., of the cerebral convolutions, the data studied being some 500 human brains investigated during the last two years by the author and Dr Varaglia. The cerebral convolutions are divided into constant and inconstant, — the former comprising nine varieties, and having probably ethnic significance, the latter (pathological, arrests of embryonal development, atavistic, progressive, etc.), being of individual significance. The author considers that the cranio-cerebral relation cannot be reduced to the confines of the cephalic index.

Letourneau (C. L.) Des rêves ancestraux. (Bull. Soc. d' Anthrop. de Paris, 1900, V^e s., I, 425–432.) After some general remarks on dreams and hallucinations, the author, believing that mental impressions, etc., can be inherited, proceeds to argue that dreams of the *déjà vu, déjà connu* type ("I seem to have been there before," etc.), and kindred impressions of the individual are "recollections hereditarily transmitted," or *ancestral dreams.* To a similar psychic subsoil may be attributed changes of character at death, infant-prodigies, etc.

von Luschan (F.) Ueber kindliche Vorstellungen bei den sogen. Naturvölkern. (Ztschr. f. Päd. Psychol. u. Pathol., Berlin, 1901, III, 89–96.) After indicating the unfairness of some of the distinctions sought to be made between savage and civilized man and noting the absurdity of some of the reports of casual visitors and the lack of skilfulness on the part of travelers in getting to understand the primitive mind, Dr von Luschan proceeds to combat the view that primitive races are "weak in thinking, and weak in abstract thinking," paying special attention to numeration. In the light of the facts that our Roman numerals represent the fingers of the hand or the hand closed, that our count clearly begins again at 11 (if not before), that French has *soixante-dix* for 70, that Homer did not know the numeral *μύριοι*, that the word *million* had its origin since 1494 (the Romans could only say *decies centena millia*), that *milliarde* dates only from 1830, and that *billion* in German and in French does not mean the same number of millions,—these and other things like the differing names of the milleped ("forty feet" with the Turk, but "thousand foot" in German),—we ought to be cautious about inferences from the mere inspection of the numerals of primitive peoples. Example of real child-actions on the part of the Maoris of New Zealand and of the Konde of the region of Lake Nyassa in Africa are given.

Macalister (A.) Variations in the ossification of the occipital bone. (Proc. Cambridge Philos. Soc., 1901, XI, 150–152.) Treats of the classification of variations in the union of the component elements. The most prolific of varieties is the *planum interparietale*, where there "are normally at least four spots at which ossification begins in this membranous area." Type forms are indicated.

McGee (W J) Man's place in nature. (Science, N. Y., 1901, N. S., XIII, 453–460.) This address appears in full in the American Anthropologist, 1901, N. S., III, 1–13.

Minakov (P. A.) Volosî bǔ antropologitcheskom' otnoshenii. (Russk. Antrop. Zhur., Moskva, 1900, I, No. 1, 83–94.) An anthropological study of the hair, with many tables and 4 text-figures. The various theories are noted, especially those of Pruner Bey and Deniker.

—— —— Nogti tchelovêtcheskoi ruki. (Ibid., No. II, 30–39.) An interesting study, with statistical tables of the nails of the human hand. By a combination of callipers and tape the real breadth (curvature) of the nail was measured, and this, compared with the apparent breadth, gave the index of flattening. Among the conclusions arrived at are the following: Greater chest-circumference is accompanied with broader nails; in individuals who use both hands equally no difference seems to occur between the two hands, but generally right-handed persons have broader and flatter nails on the right hand, and left-handed persons on the left hand. Details as to breadth, flatness, and thickness of the separate finger-nails are given. The subjects of investigation were 278 soldiers and students and a number of new-born children. The work was suggested by the study of Regnault in 1898.

Paul-Boncour (G.) Étude des modifications squelettiques consécutives à l'hémiplégie infantile. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1900, v^e s., I, 359–414.) This first section treats with 2 figures of the femur only, a detailed account with tables of measurements of the condition of six sound and six unhealthy femurs belonging to skeletons of children affected with cerebral hemiplegia. Length, weight, neck of femur, iliac impress, head of femur, cotyloid cavity, angle of neck of femur, curve of diaphysis, obliquity of diaphysis, pilaster, *linea aspera*, flattening of femur, popliteal index, muscle insertion, third trochanter, etc., are discussed at length. The presence of a third trochanter on both healthy and unhealthy femurs seems to weaken the theory of origin from muscular vigor. The healthy femurs, naturally, show the best development.

Peet (S. D.) The serpent and tree. (Amer. Antiq., Chicago, 1901, XXIII, 179–198.) Illustrated general discussion of the serpent and tree idea in the mythologies of both hemispheres, Babylonian, Scandinavian, American Indian.

Rabaud (É.) Conception générale de la monstruosité. (Rev. de l'École d'Anthrop. de Paris, 1901, XI, 97–114.)

Rabaud—*Continued*.
According to Dr Rabaud: "Teratology is the study of the variations of embryonic evolution, leading to the production, under the influence of nutritive modifications, of adult forms differing from the normal ones." Teratology, far from being an accessory part of normal embryology, is an important branch of general biology. The normal state, indeed, is only one particular case, not always the necessary or the general one. Permanence of form is related to permanence of *milieu*. Teratology is thus more comprehensive than normal embryology. The author illustrates his ideas with a schema on page 111.

Regnault (F.) La chronophotographie dans l'etnographie. (Bull. et Mém. Soc. d'Anthrop. de Paris, V^{e} S., I, 421–422.) Brief notes on chronophotographic pictures presented to the museum of the Society, made in 1895 in the laboratory of M. Marey, and of ethnic import.

—— L'évolution du costume. (Ibid., 329–344.) This article appeared also in the *Revue Scientifique*, 1901, 4^{e} s., XV, 103–112. See American Anthropologist, 1901, N. S., III, 178.

Retzius (G.) Om trepanation af hufvudskålen, såsom folksed i forna och nyara tider. (Ymer, Stockholm, 1901, XXI, 11–28.) Discusses, with 10 figures (skulls from Sweden and elsewhere in Europe, Peru, Mexico), trepanation in ancient and modern times. Of the three skulls from Alvastra in Sweden, two are meso-dolichocephalic, and one brachycephalic. In parts of the Balkan peninsula trepanning still flourishes. *See* Almgren (O.)

Rivers (W. H. R.) Primitive orientation. (Folk-Lore, London, 1901, XII, 210–212.) Brief discussion of orientation among certain primitive peoples of Africa, Asia, and Indonesia, and the folk of civilized Europe, particularly the use of right and left for north and south or vice versa, their expression by the same word, etc. For the normal and reversed position of the letter E used in testing eyesight the natives of Mabuing in Torres Straits used the terms for "windward" and "leeward," the former being used "when the open side was towards the direction of the prevailing south-east trade wind." The Heligolanders styled the position of the same letter (used by Cohn) north and south instead of right and left. Dr Rivers is of opinion that primitive man originially oriented himself in relation to his surroundings rather than in relation to himself. Hence the words for "north" and "south" are more original than those for "right" and "left."

Schwalbe (G.) Ueber die Fontanelle metopica (medio-frontalis) und ihre Bildungen. (Ztschr. f. Morphol. u. Anthrop., Stuttgart, 1901, III.) A good discussion with résumé of literature of the subject. Prof. Schwalbe holds that the four centers cannot be explained as a fact of phylogenesis or atavism, but must be regarded as a progressive phenomenon, the result of greater cerebral development. Phylogenesis could account for only two frontals.

Seashore (C. E.) Suggestions for tests, on school children. (Educ. Rev., N. Y., 1901, XXII, 69–82.) Outlines tests of observation, physical measurements, fatigue, sight, hearing, discriminative action, etc., suggested by committee of Iowa Child-Study Society in 1897 and worked out by the author in the laboratory of the State University.

Sorel (G.) La valeur sociale de l'art. (Rev. de Métaphysique et de Morale, Paris, 1901, IX, 251–278.) According to the author the mission of art is to ennoble manual labor and to make it the equal of scientific work. Artistic education, no longer the delight of the idle, is to become the basis of industrial production, that which will clothe labor with an esthetic charm.

Spitzka (E. A.) The redundancy of the pre-insula in the brains of distinguished educated men. (Med. Rec., N. Y. 1901, LIX, 940–943.) After general discussion, treats of the excessive growth and development of the left pre-insula in the two Seguins, father and son. The current view that an exposure of the island of Reil indicates a low form or defective type of brain, must be modified, since in both the Seguins, physicians of high intellectual capacity, such exposure occurs.

Stopes (H.) Unclassified worked flints. (Journ. Anthrop. Inst., Lond., 1900, XXX, 299–304.) This paper, illustrated

Stopes—*Continued.*
with 6 plates showing 70 specimens, treats of flints from Somaliland, Madras, Kent, the terrace gravels of Thames valley, Egypt, etc. The object of this study is "to help to determine the origin of common types of tools many of which have survived until the present day."

Thomas (N. W.) Animal superstitions. (Folk-Lore, London, 1901, XII, 189–194.) Records numerous items of folklore relating to domestic and wild animals reported to the author by correspondents in Asia Minor, Turkey, Poland.

Thorndike (E. L.) The intelligence of monkeys. (Pop. Sci. Mo., N. Y., 1901, LIX, 273–279.) Brief account of observations and experiments made in 1900 upon three individuals of the genus *Cebus*. According to Prof. Thorndike monkeys "occupy an intermediate position in every main psychological feature between mammals in general and the human species. In their power of vision, use of the body, physical and mental activity for the sake of activity, method of learning, etc., monkeys are nearer man. These observations of Prof. Thorndike are given in detail in "The Mental Life of Monkeys," which forms Monograph Supplement No. 15 (May, 1901) to the *Psychological Review*.

EUROPE

Almgren (O.) Ett graffält från den äldre färnåldern vid Alvastra i Östergötland. (Ymer, Stockholm, 1901, XXI, 5–10.) Treats, with 4 figures, of a burial place belonging to the first Iron age, discovered in 1900 near Alvastra, in the district of Östergötland, Sweden. The most important contents of these graves were three trepanned skulls, the first recorded from Sweden. *See* Retzius (G.)

Andersson (G.) Ett bidrag till kännedomen om hästens förekomst i Sverige under stenåldern. (Ibid., 79–91.) Discusses with 2 tables (cranium) and 3 text figures, the presence of the horse during the Stone age in Sweden. The skull-fragment in question was discovered in 1900, near Ingelstadt, with flint weapons of the later neolithic period.

Anutchin (D. N.) Veglïĭ vzylyad' na proshloe antropologiĭ i na yeya zadatchi bŭ Rossii. (Russk. Antrop. Zhur., Moskva, 1900, I, No. 1, 25–42.) A historical sketch of anthropology in the Russian Empire.

Bacher (J.) Von dem deutschen Grenzposten Lusērn im wälschen Südtirol. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 169–180.) Gives the dialect text and German translation of six folk-tales from Lusérn, a German outpost in the Italian Tirol. Continued from previous number.

Balliot (M.) Tumulus de Perrogney. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1900, V^e s., I, 446–447.) In continuing his investigations of the tumuli of Perrogney, Balliot found in one of them a coin of Nero, together with a fragment of a bracelet and a golden buckle. These tumuli were thought to belong to the Marne epoch.

Barbot (J.) Ustensiles et bibelots populaires dans la Lozère. (Rev. d. Trad. Pop., Paris, 1901, XVI, 213–214.) Describes, with 8 text-figures, whistles of young wood, noise instruments from peach-stones and nut-shells; also a guillotine for flies.

de las Barras (F.) Un ensayo de trabajos cefalométricos realizados por alumnos de segunda enseñanza. (Bol. d. l. Inst. libre de Enseñanza, Madrid, 1901, XXV, 44–46.) Gives cephalic, nasal and facial indices and head-circumferences of 19 pupils between 14 and 19 years of age in the Institute of Avila, a Spanish town, 71 miles from Madrid, at the foot of the Sierra Guadarrama. Prof. de las Barras intends to carry on these measurements year by year.

Bartsch (A.) Sagen aus Oberschlesien. (Mitth. d. Schles. Ges. f. Volkskunde, Breslau, 1901, 45–53.) Brief notes of folk-tales from Upper Silesia, relating to water-spirits, mountain-spirits, *moras*, dragon, serpent, mouse, horse, dog, cat, dove, frog, etc. These tales were collected by the author, who is a teacher in Benthen, from his pupils.

Bellucci (G.) Amulettes Italiennes anciennes et contemporaines. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1900, V^e s., I, 275–286.) A descriptive list of Italian amulets, ancient and modern,

Bellucci—*Continued.*
exhibited by Signor G. Bellucci at the Exposition of 1900, numbering 72 of each sort.

Beltz (R.) Erläuterung der Karten zur Vorgeschichte von Mecklenburg. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1901, XXXII, 30–32, 37–39.) Continuation and conclusion of Dr Beltz's explanatory discussion of the prehistory of Mecklenburg as indicated on the four maps published by him. The third map deals with the Celtic and Roman Iron age,—up to this time there has been from the Stone age to the Age of Iron a continuity of burial customs, and, inferentially, of population. Then, with the time of the fourth map, comes a break, and a new people, the Wends, dominate Mecklenburg for 600 years, after which the Germanization of the land occurred.

Bischoff (H.) Die germanisch-romanische Sprachgrenze in Belgien und Nordfrankreich. (Globus, Braunschweig, 1901, LXXIX, 94–97.) Critical review of Kurth's recent work on this subject. The difference between political conquest and real taking possession of a country is emphasized. The history of language in this region is of great interest. Here we have illustrated the curious fact that bilingual people ultimately give up their own speech.

Bloch (A.) Galien anthropologiste. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1900, V^e s., I, 347–359.) Galen (b. 131 A.D.), the celebrated Greek physician, is for anthropologists the most important writer of antiquity, having made a special study of the organism of the anthropoid ape, and having made observations on various human races. He is also said to have been the first to employ the word *σκελετός* to the bony ensemble. Dr Bloch cites from the work of Galen passages concerning articulation, musculature, hair, eyes, skin, Celts and Teutons, etc.

—— Interprétation anthropologique du mot Latin *Gallus*, Gaulois. (Ibid., 432–440.) The author produces evidence to show that *Gallus* ("Gaul") is identical with *gallus* ("rooster"), an essentially Latin word. Celts, Galates, and Gauls are words not derived from one root, and therefore not akin to each other. The fact that the Gauls were looked upon as "red,"—in French a ruddy-complexioned man is still described as *rouge comme un coq*,—made the passage from the fowl to the human being easy.

Blümml (E. K.) Beiträge zur Flora der Friedhöfe in Niederösterreich. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 210–213.) After noting the scarcity of literature on the subject, the author gives a list of fifty species of plants found in some seven cemeteries in Lower Austria. An interesting contribution to folk-esthetics.

Body (A.) La légende Spadoise du pied de St.-Remacle. (Wallonia, Liège, 1901, IX, 113–125.) Interesting detailed historical account of the legend of the foot of St Remacle, one of the many stories connected with Spa and its springs. By placing her foot in the miraculous imprint of that of St Remacle, any woman suffering from sterility, who likewise drinks of the waters of Sauvenière, will become a mother.

Brissaud (J.) La couvade en Béarn et chez les Basques. (Rev. d. Pyrénées, 1900, 225–239.) An attempt, after discussing the various theories about the "couvade," and referring to the literature of the subject, to indicate how much truth and how much myth exist concerning it. The cases of "couvade" among the Basques are said to be more historical than actual. In reviewing Dr Brissaud's article in *Anthropologie* (1901, XII, 199), M. É. Cartailhac suggests an element of humor due to reaction against the laws of the Pyrenees so favorable to woman, as having something to do with the couvade tradition. But this would not explain its existence elsewhere in the world.

Bünker (J. R.) Typen von Dorffluren an der dreifachen Grenze von Niederösterreich, Ungarn und Steiermark. (Mitth. d. Anthrop. Ges. in Wien, 1900, XXX, N. F. XX, 109–148.) Contains detailed descriptions, with plans in the text, of Mariasdorf, Willersdorf, Schmeidreuth, Oberschützen, Hattmannsdorf, which villages all lie about the (Lower) Austrian-Hungarian-Styrian border. Situation, population, land division and allotment, taxation, history, etc., are considered. This

Bünker—*Continued.*
paper, representing the results of the author's studies on the spot during portions of the years 1897–1899, is a valuable addition to the literature of the village community.

Buschan (G.) Der Stand unserer Kenntnis über die Basken. (Globus, Braunschweig, 1901, LXXIX, 117–124.) An excellent résumé, with bibliography, of our present knowledge of the Basques,—language, physical characteristics (stature and skull-form in particular), history, etc. Dr Buschan, recognizing an undoubted "Basque type," considers it probable that "this Basque race has arisen from a crossing of the shortheaded (immigrant in early prehistoric times from Asia) and the native (Mediterranean) long-headed race, aided by long ages of inbreeding."

Capitan (L.) Les divers instruments chelléens et acheuléens compris sous la denomination unique de *coup-de-poing*. (Anthropologie, Paris, 1901, XII, 111–118.) Paper read at Congress of 1900, illustrated with 9 text-figures. M. Capitan tries to show that there was really considerable variety in the implements from the oldest alluvium, the so-called *coup-de-poing* representing a long series of implements of divers forms, and probably very diverse uses.

—— Exposition de l' École d' Anthropologie et de la Sous-Commission des Monuments Mégalithiques. Catalogue raisonné et descriptif. (Bull. et. Mém. Soc. d'Anthrop. de Paris, 1900, v^e s., I, 295–319.) This excellent descriptive catalogue of the Paris exhibit of the École d' Anthropologie and the Sub-Commission on Megalithic Monuments relates to prehistoric art, architecture, and industries, ranging from the engravings of the cave-men to the specimens (vases, ornaments arms) from the Gaulish cemeteries of the Marne, where the beginnings of Roman influence are perceptible.

Coelho (T.) O Senhor Sete. (A Tradição, Serpa, 1901, III, 56–37.) Continued from previous number. Folk-lore of "seven."

Colson (O.) Le loup-garon. (Wallonia, Liège, 1901, IX, 49–59.) A brief general account of the werwolf in the folk-thought of Belgium. The werwolf is the form the servant of the devil most commonly takes. Like the modern French (*loup-garou*) Walloon has the pleonastic form *loup-warou* ("wolf man-wolf"). Another term in use *vertbouc*, the author considers to signify "man goat." In Hainault the werwolf is replaced by the *tché à tchaînes* ("chien à chaînes") and the dog appears elsewhere in the Walloon country, as the *tchin de l'ronhe* ("chien de la ronce"). The werwolf's elbows and knees are "backwards." In Ardennes the skin he covers himself with is thought to be that of a male wolf. A "lady killer" is said to be *amoureux comme un loup-warou.*

Conradt (Frieda) Das Leben einer deutschen Hausfrau in Kamerun. (Globus, Braunschweig, 1901, LXXIX, 135–140.) Account, with 5 illustrations in the text, of a German woman's round of life in the Cameroons, with notes about the natives.

De Cock (A.) Le garçon au bonnet rouge. (Rev. de Trad. Pop., Paris, 1901, XVI, 217–231.) Text, from Rembeke (West Flanders) of "the red-cap-boy," a pursuit-tale, with reference to 40 variants or similar legends from Europe, Asia, Africa, America, Oceania.

Douchez (L.) Croissance des élèves d'une école professionnelle pendant l'année scolaire. (Bullet. d. l. Soc. libre p. l'étude psychol. de l'enfant, Paris, 1901, I, 34–41). Gives, with three sets of curves, results of measurements of weight, height, and chest girth, taken in 1889–90 and 1890–91 on 269 pupils (aged 12–15 years) in the National Professional School at Vierzon. The author finds the results of Malling-Hansen and Daffner (as to periodicity of growth in weight and height) and those of Binet and Ignatief (as to the retarding influence of examinations) more or less confirmed.

Drechsler (P.) Der Wassermann im schlesischen Volksglauben. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 201–207.) Items of folk-lore about the "water man," and his wife the "water woman," in German and Polish Silesia, and their actions. Among the topics noted are: His charming away of living things into the deep where he lives; his strife with the miller and his wheel;

Drechsler—*Continued*
his variety of form (fish, bird, dog, horse, man, etc.); his laughter and playing with the water. Consecrated bread is a talisman against the water-spirit. He can be caught with a consecrated rope, and subdued with the left hand. The "water man" is particularly at home in Upper Silesia.

Ellis (H.) A study of British genius. (Pop. Sci. Mo., N. Y., 1901, LIX, 209–216.) Continued from previous number. Treats of marriage and family, longevity. British men of genius show a tendency not only to marry seldom, but to marry late, while with women there is "a tendency for the years of greatest reproductive activity to be reserved for intellectual development, by accelerating or retarding the disturbing emotional and practical influences of real life." The statistics as to family "confirm only to a limited extent the belief in the relative sterility of men of genius." Moreover, the average fertility of non-barren marriages is not at all small. In general, "families of men of genius differ from genius-producing families by approximating to normal families. An excess of boys in the families of men of genius (corresponding to a similar excess in genius-producing families) is suggested by the statistics. The author finds an evolutional reason for the common longevity of men of genius in the fact that "they must live a long time, or they will never become eminent." This, more than the favorable circumstances of intellectual avocations, explains why death comes so late,—fame in most walks of life being very slowly achieved. A very low mortality is noticeable between the ages of 53 and 57, —"after the first climax at 49 the feeble have mostly died out, and the vigorous are then in possession of their best powers and working at full pressure." Fifty-seven seems to be "a critical age at which exhaustion and collapse are specially liable to occur."

—— A study of British genius. (Ibid., 266–272.) This seventh section of Mr Ellis' study discusses the pathology of genius, — brain - lesions, consumption, asthma, angina pectoris, gout, stone, insanity, and other rather frequently occurring affections are referred to. The author's general conclusion seems to be that "if the man of genius is all the better for a slight ferment of disease [gout, *e. g.*], we must not forget that if he is to accomplish much hard work he also requires a robust constitution." Gout in the joints tends to make the mind of the genius "abnormally clear and vigorous"; in the blood, "to abnormally overcloud his brain." The relationship between genius and insanity "is far from being either so frequent or so significant as is assumed by some writers"—for "genius cannot be accurately defined as a disease." The statistics of British men of genius "do not furnish a single shred of evidence in support of the theory that genius is an epileptoid neurosis." While neurasthenia is common, "grave nervous diseases of definite type" are rare. Clumsiness in the use of the hands and in walking are, Mr Ellis thinks, of considerable significance.

Ernault (E.) Dictons et proverbes Bretons. (Mélusine, Paris, 1901, X, 158–163, 187–188.) Continuation of interpretative catalogue of Breton proverbs and sayings: *Fier-Fossé.* Breton text and French translation are given.

Eysn (Marie). Über einige Votivgaben im Salzburger Flachgau. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 181–186.) Describes, with 8 figures in the text, certain face-urns and wood-carvings (now substituted by wax models) offered up as votive gifts at sacred places near Salzburg in extreme western Austria. The former are offered up on account of headache; the latter for affections of the internal organs. Other votive customs are also noted.

von Fellenberg (E.) Ueber den Bronzefund in Muri bei Bern. (Verh. d. Berl. Ges. f. Anthrop., 1901, 34–36.) Brief account of bronze remains (statuettes of deities, etc.) from Muri belonging to the Roman period. These were discovered partly in 1660, partly in 1832.

Fuchs (K.) Magyarische Grabpfähle. Mitth. d. Anthrop. Ges. in Wien, 1900, XXX, N. F. XX, 149–151.) Brief account, with 18 figures in the text, of the "grave-posts" of the Székl people buried in Kronstadt in Transylvania. In the Székl dialect these posts are called *sir-fa* ("grave-wood"), and are set up some time after the interment, when a fair brings the relatives to town. The "grave-posts" look very much like the end-posts of houses or even of some

Fuchs—*Continued.*
of our old bedsteads and like pieces of furniture. The author gives also, in Magyar with German translation, five epitaphs from these graves. The dead here concerned are mostly soldiers and domestics. The inscriptions belong to the folk.

Garson (J. G.) The metric system of identification of criminals, as used in Great Britain and Ireland. (Journ. Anthrop. Inst., Lond., 1900, XXX, 161–168.) Detailed account, with schedules, of Dr Garson's modification of the Bertillon-Galton systems. Technics, liability to error, records, etc., are treated of. The great utility and applicability of the Galton finger-print tests are doubted. For British criminals the Garson system is said to have worked well. A fact of interest in this connection is that in India, by reason of the impossibility of securing, at widely distant stations, accurate observers, the Bertillon system has practically been abandoned in favor of Galton's finger-print test.

Haddon (A. C.) The language and origin of the Basques. (Nature, London, 1901, LXIV, 90–91.) A brief review of contemporary scientific opinion on the subject.

Hammarstedt (E.) Lussi St. Lucia. (Medd. fr. Nord. Mus., Stockholm, 1898 [1900], 1–38.) A detailed discussion, with a plate and a text-figure of the worship of St Lucia in Christian lands and its relation to heathen religions. The author concludes that the festivals of St Lucia, in the Catholic countries of Europe, are largely heathen survivals. In Scandinavian folk-belief Lucia is a personification of growth in Nature, given perpetuation by the Christian church.

Hamy (E. T.) La grotte néolithique de Géménon, Bouches-du-Rhône. (Bull. d. Mus. d'Hist. Nat., Paris, 1900, 405–409.) Brief description with measurements of male and female skulls found in the Géménos grotto in 1876, and now in the Museum, also of a skull from a pre-Roman tumulus in Peyrolles, which reproduces the characteristics of the Géménos crania. The female skull is rather voluminous (capacity 1,605 + ccm.), and all three are dolichocephalic.

—— Note sur une sépulture néolithique de Fonvieille-lès-Arles. (Ibid., 1901, 8–10.) Brief descriptions, with measurements, of four skulls (one brachycephalic) from the grotto of Castellet and a tomb at Fonvieille, investigated in 1871. Dr Hamy considers that the fourth skull indicates the presence in Provence at the end of the Neolithic period of "a brachycephalic, eurygnathous element, which in one day has risen to be the preponderating one."

Harou (A.) Notes sur les traditions et les coutumes de la Province de Liège. (Rev. d. Trad. Pop., Paris, 1901, XVI, 110–116.) Items of folk-lore from Liège relating to folk fauna and flora, astronomy and meteorology, human life, the human body, folk-medicine, dreams, etc. When one gapes or yawns it is said "his heart is *drowned*." To place a child at full length on the ground and jump over him will stop growth. At Esneux tomatoes are still called "love-apples" (*pommes d'-amour*).

Heusler (A.) Die altnordischen Rätsel. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 117–149.) A detailed discussion of the old Norse riddles in the Hervarar saga, with estimate of their poetical qualities and their value as culture-material. According to the author they belong to the very best riddle-verses, and were thoroughly popular in their nature, when one takes into consideration the social relations of Iceland at the time,—they are Norse, pre-literary, pre-Christian, pre-chivalric, and in them lives the Viking age. Two thirds of the *motifs* are taken from nature, and one of the commonest of these is the vivifying of the inanimate.

Höfler (M.) Sankt Michaelsbrot. (Ibid., 193–201.) Describes, with 4 text-figures, the St Michael's bread or cakes and certain customs connected with them in various countries of Europe (Germany and Switzerland in particular.) On Michaelmas day offerings were commonly made to the dead, and the day was thought to have influence on seed-time and harvest. According to Dr Höfler, the St Michael customs prove that the Teutonic New Year was connected with a pronounced funeral ceremony and a harvest-festival.

Höfler—*Continued.*

—— St. Hubertus-Schlüssel. (Ibid., 207–210.) Brief account, with a figure in the text, of two St Hubert "keys" (really long iron nails, with seal-shaped heads) from the Spessart. These "keys" are used in cases of hydrophobia to cauterize the wound or to brand the dog. Directions for their use are cited from a manuscript of 1757.

Hoppin (J. C.) Three Argive lekythi in the Museum of Fine Arts in Boston. (Amer. Journ. Archæol., Norwood, Mass., 1900, IV, 441–457.) Detailed description (with 3 plates) and discussion of three lekythi of somewhat uncertain history, which the author styles "Argive," rather than "Proto-Corinthian," since "the rightful home of the style lies in the Argolid,"—which theory he produces evidence to support. The Argive style is a direct offshoot of the Mycenæan and not a connecting link between the geometric and the Corinthian, being older than hitherto believed.

Ihm (M.) Ein römisches Mosaik aus Veji (Globus, Braunschweig, 1901, LXXIX, 250–252.) Description with cut of a Roman mosaic from Veii (Isola Farnese) representing the taking on board ship of an African elephant,—Veii may have been one of the old wild-animal depots of the Imperial régime. The mosaic was discovered in 1889.

mbert (M.) L' archéologie à l' Exposition de 1900. (Bull. Soc. d. Amis d. Sci. et Arts de Rochechouart, 1900, X, 57–66.) First part of notes on the display relating to prehistoric archeology at the Paris Exposition. The megalithic monuments; the Piette collection of specimens of art from the Magdalenian epoch in bone, ivory, and horn (some 20 representations of the human figure are included), and other collections representing the industries of the period (the most remarkable specimen is an engraving of a double phallus); collections illustrating the art and activities of cave-man, etc., are briefly referred to. The article is accompanied by 2 plates containing 8 figures.

Ivanovski (A. A.) D. N. Anutchin. (Russk. Antrop. Zhur., Moskva, 1900, I, No. 1, 1–24.) A sketch, with portrait, of the 25 years' scientific activity of Anutchin, the eminent Russian anthropologist, whose jubilee was celebrated March 30, 1900. A bibliography of his writings (1873-1900), containing 201 titles, chiefly in Russian, is appended.

Janvier (Catharine A.) Vine-grafting in southern France. (Folk-Lore, London, 1901, XII, 194–197.) Reports from Provence the custom (now obsolete, or at least obsolescent) of having the first grafting done by a young (healthy, good, and beautiful, if possible) virgin.

K. (L.) Aus'm Wellsgrund. (Mitth. d. Schles. Ges. f. Volkskunde, Breslau, 1901, 53–58.) Notes on places and names, peculiar words and expressions, technical terms, etc., recorded from a native of Wellsgrund, *i. e.* Wölfelsgrund,—the text is in the dialect of the locality, with transcription of chief words into literary German. Names of villages, mountains, meadows, roads, streams; of individuals, nicknames, abbreviations; calls for domestic animals; names of animals and plants; dialect phrases and words; names of servants; agricultural terms and names of house and farm furniture and implements; expressions relating to forestry and hunting; terms of abuse, etc., are enumerated.

K. (Z. A.) "Przepowiadki" z Jóswowa. (Wisła, Warszawa, 1901, XV, 15–16.) Facetiæ from Jóswów in the Lubelsk district.

Kaindl (R. F.) Aus der Volksüberlieferung der Bojken. (Globus, Braunschweig, 1901, LXXIX, 150–155.) Interesting sketch (with picture of dance) of the folk-life of the Bojke, a Ruthenian people of the Carpathians, neighbors of the Huzule. House and farm, festivals, superstition, folk-magic and folk-medicine, death-watch, St Andrew's and Christmas days, Easter, St John's day, love-oracles, the "Majki," or maids of the rocks, music, property, etc., are treated. With these people the memory of "the terrible Tatars" still lingers.

—— Ruthenische Hochzeitsgebräuche in der Bukowina. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 158–169.) First part of an account of the wedding-customs of the Ruthenians of the Bukowina, in eastern Austro-Hungary.

Kaindl—*Continued.*
A detailed description (with Ruthenian text and German translation of the songs used) is given of a wedding among the Ruthenians of the foot-hills between Wiznitz and Berhomet on the river Sereth. Consent of the parents is required even when the contracting parties are of age; marriages between blood-relations are permitted only with the sixth degree, etc. Betrothals are binding, and marriage is regarded as irrevocable.

Karutz (R.) Eine schottische Rachepuppe. (Globus, Braunschweig, 1901, LXXIX, 110–111.) Describes, with figure, a "witch doll" from Scotland now in the Lübeck Museum, with some remarks on sympathetic magic.

Khvoïka (V.) Découvertes paléolithiques ques récemment faites en Russie. (Anthropologie, Paris, 1901, XII, 158–159.) Brief abstract of paper read at Congress of 1900. Treats of the investigations up to the present of the paleolithic station discovered in 1894 on St Cyril St. in the city of Kiev,—here some 50 skeletons of the mammoth, remains of a rhinoceros, tree-trunks, flint implements, etc., have been found. The most interesting specimens, however, are two mammoth-tusks, one of which has been incised and notched by a flint tool, the other is covered with neat engravings, which represent apparently fauna and flora of the time. The condition of these tusks, Prof. Khvoïka thinks, proves that here man was contemporary with the mammoth, and did not follow him, as Prof. Anutchin holds.

Koren (A.) Die Körperlänge norwegischer Soldaten. (Corrbl. d. deutschen Ges. f. Anthrop., 1901, XXXII, 46.) Brief résumé of the results of the measurements of 1,284 soldiers in their twenty-second (1893) and twenty-eighth years (1899.) Increase of stature during this time was noted in 83.41 %, decrease in 6.07 %, no change in 10.52 %. These investigations clearly indicate that there is not a little individual growth after the twenty-second year and that such growth has not entirely ceased even at the twenty-eighth year. The average height of the 1,284 soldiers was, in 1893, 169.71 cm., in 1899, 171.34 cm., an increase of 1.63 cm. Measurements taken of 48 soldiers in 1898 and 1899 show an average increase for the year of 1.0 cm.

Law (L. A.) Death and burial customs in Wiltshire. (Folk-Lore, London, 1900, XI, 344–347.) Death omens and portents, fear of corpses, ghosts.

Lazęga (R.) Powiat Brodnicki. (Wisła, Warszawa, 1901, XV, 29–51. An historical account, based upon recent studies, of the district of Strassburg (Polish Brodnick) in West Prussia, near the border of Poland. With map.

Ledieu (A.) Formule enfantine pratiquée en Picardie et en Suisse. (Rev. d. Trad. Pop., Paris, 1901, XVI, 194–196.) Text of a counting-out rhyme with comments. The rhyme contains names (now disguised) of children,—schoolmates at the time of its creation probably,—and is used in connection with the running game called *au fiou*, to tell by eliminations who is "it."

Lewis (A. L.) The stone circles of Scotland. (Amer. Antiq., Chicago, 1901, XXIII, 199–203.) Brief account of the Ring of Brogar, the Stones of Stenness (Orkney), the Callernish Circle (Island of Lewis), with notes on the Inverness and Aberdeen types. A detailed account of the author's investigations appears in the Journal of the Anthropological Institute (London) for 1900.

Mac Phail (M.) Folk-lore from the Hebrides. (Folk-Lore, London, 1900, XI, 439–450.) Continued from previous volume. Treats of agricultural customs, fairy-lore, leechcraft.

Magiera (J. F.) Uwagi nad przyswojenrami w gwarach naszych. (Wisła, Warszawa, 1901, XV, 145–152.) Treats of assimilation in foreign words in Polish dialects. Numerous examples of German loan-words are given. Humorous renderings and distortions of foreign phrases are also noted: *Pikula pikulorum* for *sæcula sæculorum; sa piecem torba* for *sursum corda, etc.*

Manouvrier (L.) A propos de la reconstitution plastique du Pithecanthropus. (Anthropologie, Paris, 1901, XII, 103–104.) Brief discussion of the figure of the *Pithecanthropus* as restored by Dr Dubois and exhibited at the Netherland-Indies Exposition, at the Trocadéro. Dr Manouvrier again repeats his belief that the remains of

Manouvrier—*Continued.* Trinil prove that "the oldest known phase of human development is at the same time the nearest, morphologically, to the anthropoids." Paper read at Congress of 1900.

March (H. C.) Dorset folklore. (Folk-Lore, London, 1900, XI, 107-112.) Items 23-31, continued from previous volume. Folk-medicine.

Maška (C.) La station paléolithique de Predmost en Moravie. (Anthropologie, Paris, 1901, XII, 147–149.) Paper read at Congress of 1900. Gives brief account of what is perhaps "the richest and most important Quaternary station of central Europe," the mammoth hunters' abode (explored by the author in 1882–1894) at Predmost, near Prevov, Moravia. Here the remains of the mammoth abound, and there have been discovered also 20 human skeletons, besides some 15,000 flint implements, a large number of ivory and bone objects, ornaments, etc. The skull of a young adult strikingly resembles the famous Neanderthal cranium. The geometric ornamentation and the carvings on bone and ivory are of great importance.

Mehlis (C.) Prähistorische Schleudersteine aus dem Mittelrheinlande. (Globus, Braunschweig, 1901, LXXIX, 206–208.) Treats, with three text-figures, of sling-stones used in prehistoric times (some in the neolithic period proper). The specimens in question came from the Middle Rhine country,— Frankweiler, Maimont, etc.

Milewska (J.) Kolysanki z Ciechanowskiego. (Wisła, Warszawa, 1901, XV, 17–26. Lullabies from the district of Ciechanów, with text and musical notation.

von Miske (Kálmán, *Freiherr*). Hochhenklige Gefässe von Velem-St. Veit. (Mitth. d. Anthrop. Ges. in Wien, 1900. XXX, N. F. XX, 152–154.) Describes briefly with plate (containing 15 figures) the high-handled vases of the bronze age from the prehistoric settlement whose remains are situated at Velem-St Veit. The outer surface of these vases is highly polished. One of the specimens shows clearly that such vessels were repaired in prehistoric times. Several of the vessels are of transitional (to Hallstatt period) type.

Morin (L.) Les sorciers dans la région Troyenne. (Rev. d. Trad. Pop., Paris, 1901, XVI, 154–161, 267–273.) Treats of witchcraft in the region of Troyes in northeastern France, with illustrations from ecclesiastical legislation, local legends, etc. Some of the villages in this part of the country had a great reputation for witches. Of Galilée the saying went, "in Galilée 12 houses, 13 witches," and of Orquevaux "more witches than horses," of De Sognes that the inhabitants were all witches. A case before the courts of Bar-sur-Aube, as late as 1851, involved belief in witchcraft, and it has not entirely disappeared even now.

de Mortillet (A.) Catalogue de l' Exposition de la Société d' Anthropologie de Paris. (Bull. et Mém. Soc. d' Anthrop. de Paris, 1900, v^e s., I, 254–294.) Catalogue of the exhibition of the Anthropological Society of Paris at the exposition of 1900, classified according to the palethnological ideas of G. de Mortillet. The collections embrace specimens ranging from the flints of Thenay (Lower Miocene?) to remains of the Mérovingian period. Included are also some specimens (paleolithic and neolithic) from countries outside of France, and from other continents. A most interesting section of the exhibit was the Bellucci series of ancient and modern Italian amulets. See Bellucci (G).

de Munck (E.) Le Quaternaire des plaines du Hainault. (Anthropologie Paris, 1901, XII, 135–137.) Paper read before the Congress of 1900. A succinct historical *résumé* of the subject, with indications of the geological strata, their depth, contents, etc.

von Negelein (J.) Die Reise der Seele ins Jenseits. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 149–158.) This second section deals with the road taken by the soul in its journey to the other world. Among the topics touched upon are: Nature of the death-path, terms for "to die," length of journey, the path of the demons of disease and death, search for and tests of the presence of the dead, etc. The author notes the fact that in Germany the opinion prevails that the dead wander far and long; "the long journey" is thus a common euphemism.

Nicolet (C.) Les "sîses" et les "hantreies" au pays de Francorchamps. (Wallonia, Liège, 1901, IX, 100–107.) Treats of the social activities of young people in the Francorchamps regions of the Ardennes. The *sîse* is the Ardennes "evening" with its amusements,—on Sunday evening the young men are allowed to call on any young lady, the *hantreie*, the "courting-time."

Northcote (Rosalind) Devonshire folklore, collected among the people near Exeter within the last five or six years. (Folk-Lore, London, 1900, XI, 212–217.) Items relating to goblindom, witchcraft, folk-medicine.

Ohr (J.) Przystowia rabinów. (Wisła-Warszawa, 1901, XV, 53–59.) Forty-three rabbinical proverbs, with explanations, etc.

Parat (A.) Les grottes de la Cure et de l'Yonne. (Anthropologie, Paris, 1901, XII, 119–134.) Paper read at Congress of 1900. Some 100 caves and grottos in the department of Yonne are listed. Some 60 have been more or less explored by the author,—of these some 15 are briefly described, the Trilobite grotto in the Cure valley, and the grotto des Fées, in the same region, being treated more in detail. The Abbé Parat recognizes in the Seine basin four epochs of the cavern period, differentiated geologically and by the fauna and remains of human industry. The last epoch has a fauna quite different from the rest and the implements are *sui generis*, indicating perhaps emigration at the beginning of the period. In the Trilobite grotto there was discovered the upper portion of the humerus of a reindeer on which was incised a branch of some tree or plant with leaves and flowers.

Paton (W. R.) Folk-tales from the Ægean. (Folk-Lore, London, 1900, XI, 113–119, 333–344; 1901, XI, — 97, 197–208.) Gives the English text of eighteen tales of all sorts concerning a variety of topics, from the islands of the Ægean sea, etc. The articles began in volume X.

Peacock (Mabel) The folklore of Lincolnshire. (Ibid., 161–180.) Items of popular belief relating to stones, the weather, wind, heavenly bodies, love-charms, fairies, giants, goblins, witchcraft and counter-magic, taboos, etc. The author notes that the folklore of Lincolnshire is rather "prosaic" and is "lacking in the beauties which distinguish the conceptions of the Celtic peoples," but "it is scarcely possible yet to come to a definite conclusion as to a connection between Lincolnshire and Scandinavian beliefs." The old custom of "luck-money" on purchases seems bound to disappear, although "on a certain day in August, 1898, a large number of buyers kept aloof from the auction sale in Lincoln market because 'luck-money' was withheld."

Pichler (F.) Ladinische Studien aus dem Enneberger Thale Tirols. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1901, XXXII, 39–40, 41–45.) Besides a discussion of such general names as *Ladin*, etc., and such particular ones as *Enneberg*, the author gives from the folk-speech of the region lists of 170 names of mountains, 300 place-names, some 50 names of streams and lakes, and some 40 valley-names, often with brief historical or etymological annotations.

Piroutet (M.) Note sur les sépultures antérieures à l' âge du fer dans le Jura salinois. (Anthropologie, Paris, 1901, XII, 29–40.) Author cites evidence to show that, while in the Jura region megalithic burials do not occur and sepulchral caverns are extremely rare, tumuli of the neolithic period and the early metal period are not so rare. Purely neolithic burials occur in considerable numbers in the region of Salins,—of some of these brief descriptions are given. Some tumuli of the bronze age are also referred to.

Pommerol (F.) Anciennes prières en patois d' Auvergne. (Rev. d. Trad. Pop., Paris, 1901, XVI, 161–165.) Dialect text with translation of three prayers, one to Ste Barbe, one on the Passion of Jesus Christ, and another with the curious title *Lais vervais-Dieu*, perhaps *Verba Dei*. In the first occur the words *Sint-Outino*, *foutino*, with no significance. Dr Pommerol suggests a transference from pagan mythology. St Outino is certainly a new saint.

Rademacher (C.) Dr Soldan's Ausgrabung einer vorrömischen Stadt bei Neuhäusel in Nassau. (Globus, Braunschweig, 1901, LXXIX, 63–65.)

Rademacher—*Continued.*
Brief account of the discovery by Dr Soldan of an extensive settlement of the Hallstatt period (700–400 B.C.) near Neuhäusel (about two leagues from Coblenz). No Roman remains have been discovered.

Radlinski (I.) Apokryfy Judaistyezno-Chrześcijańskie. (Wisła, Warszawa, 1901, xv, 184–196.) This "preliminary note" treats of Polish apocryphal Judeo-Christian literature. The apocalypses, assumptions, ascensions, etc., of Moses, Baruch, Isaiah, are discussed, with references to literature.

Raff (Helene) Volksmeinungen von der bayerisch-österreichischen Grenze. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, xi, 219–221.) Items of folk-lore from the Bavarian-Austrian border concerning the Hallthurm fortifications.

Reinach (S.) Acquisitions du Musée de Saint-Germain-en-Laye en l'an 1900. (Anthropologie, Paris, 1901, xii, 166–171.) Describes briefly, with 6 text-figures, the stone, bronze, iron, and gold specimens from France, Ireland, Egypt, Somaliland, Greece, etc., added to the Museum in 1900. Among other things the Museum has recently acquired four of the "statues-menhirs" from Aveyron, which were on exhibition at the Trocadéro.

Reinecke (P.) Ein Grabfund der Spät-La Tènezeit von Heidingsfeld in Unterfranken. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1901, xxxii, 27–29.) From letters and reports dating 1850–1851, the author describes briefly the grave and contents (opened in 1850) at Heidingsfeld, important as being "the first known grave of the late La Tène period in northern Bavaria," and of considerable ethnographic significance besides. There seems to be evidence of Celts in the region about Würzburg in the late La Tène period.

—— Germanengräber der römischen Kaiserzeit aus den rechtsrheinischen Gebieten Süd- und Westdeutschlands. (Ibid., 33–37.) Discusses recent finds of Teutonic remains belonging to the period of the Roman Empire on the Lippe, at Giessen, on the Lahn, on the Main, near the Bodensee, near Heidelberg, at Grossgerau, etc. According to Dr Reinecke the Teutonic skeleton-graves, when compared with the contemporaneous provincial Roman graves, indicate by their contents "the marked difference between the Teutons on the right bank of the Rhine and the provincial Roman population on the left. On the right bank of the Rhine, in spite of evident Roman influence, the connections are with the distant Teutonic regions of North Germany."

Rémond (M.) Douze cent mille ans d'humanité et l'age de la terre. (Anthropologie, Paris, 1901, xii, 105–107.) From mathematical calculations having reference to the inclination of the earth's axis, the author of this curious paper read at the International Congress of Prehistoric Anthropology and Archeology (Paris, 1900), concludes that the earth has been habitable for 3 milliards 400 millions of years, and that man knowing how to fashion implements has existed on it for at least 1,200,000 years.

Richardson (R. B.) The fountain of Glauce at Corinth. (Amer. Journ. Archæol., Norwood, Mass., 1900, iv, 458–475.) Account of the discovery in 1899 (with historical sketch) of the fountain of Glauce, one of the monuments of ancient Corinth. The article is accompanied by a plate and 6 figures.

Rivère (É.) La Dordogne préhistorique. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1900, v^{e} s., i, 422–423.) Brief report on explorations made in 1900, in the Dordogne caves, including a new one, the grotto of Liveyre.

Rosanov (V. N.) Gynekomastiya. (Russk. Antrop. Zhur., Moskva, 1900, i., No. iv, 21–36.) This article, illustrated with 5 text-figures and accompanied by references to the literature of the subject, treats in detail of gynæcomastia in a 17-year-old peasant,—the enlarged mammæ were removed and microscopically examined. At pages 34–35 the anthropometric data of the individual in question are given in detail.

Ruge (S.) Rattenberger Studien zur Volkskunde aus dem unteren Innthal in Tirol und aus Oberbaiern. (Globus, Braunschweig, 1901, lxxix, 165–171, 183–188.) Topographical, historical, linguistic (sematological) notes on places in the Tirol-Bavarian region of Rattenberg. At pages 185–187 is a

Ruge—*Continued.*
valuable list of place-names in parallel column with the corresponding family-names. The basal words numbering more than 100 used as place names in the Bavarian dialect give rise to more than 4000 place-names in Bavaria, or one-twelfth of all names in use. Some of the names are spelled in very many ways (Reut 22 times), and the number of *Meyer* (Maier, etc.) is legion. This article is illustrated with 5 figures.

Rumel (A.) Obrzędy weselne we wsi Masi. (Wisła, Warszawa, 1901, XV, 7–12.) Brief account of marriage rites at Masi in the Białostock district, government of Grodno (Poland), with texts of songs.

—— Preśń dożynkowa. (Ibid., 13–14.) Text of harvest-song from Masi.

Schoetensack (O.) A quoi servaient les "bâtons de commandement?" (Anthropologie, Paris, 1901, XII, 140–144.) This paper, read at the Congress of 1900, is illustrated with five text-figures and one plate. According to the author, these *bâtons*, of which a goodly number have been discovered in stations of the Magdalenian epoch (at Veyrier, *e. g.*) are nothing more than *fibulæ* or clothes-fasteners. This ingenious suggestion is emphasized by the plate, on which Dr Schoetensack has portrayed five individuals of the reindeer period in France (typed as Eskimo) wearing *fibulæ* in the fashion suggested. This idea gives a reason for the ornamentation as well as the perforation of these articles. One of the ornaments on the "bâtons" from Veyrier he considers to represent a string of animals' teeth.

—— Sur un os sculpté de la grotte paléolithique de Thayingen. (Ibid., 145–146.) Treats of the figure of an animal carved on a round piece of bone from the paleolithic grotto of Kesslerloch at Thayingen, Switzerland. The specimen is interesting as an example of one-sided sculpture.

Schuchardt (H.) Zum Stande unserer Kenntnis über die Basken. (Globus, Braunschweig, 1901, LXXIX, 208.) Brief but interesting note on the characteristics of the Basque language,—a protest against widespread misconceptions, many of which, repeated by modern authorities, go back to Yanguas in 1843. The "monsters" of Basque composition can easily be equaled in German.

Sébillot (P.) Cultes pré-mégalithiques et préhistoriques. (Rev. d. Trad. Pop., Paris, 1901, XVI, 65–71.) Treats of certain practices (such as girls sliding down stones or rocks, prospective parents or newly-married people rubbing themselves against stones or rocks, running round such objects, passing the head, hand, or a child through pierced rocks) reported from various parts of France (chiefly Brittany). These practices are connected in folk-thought with marriage, fecundity, etc. The author terms them "*pre*-megalithic," because, in all probability, natural stones and rocks served these purposes before menhir or dolmens were erected.

—— Contes et légendes de la Haute-Bretagne. (Ibid., 119–151.) This section contains: The Sun's Marriage, The Ball of Fire, The Old Soldier, The Devil's Daughter, and The Four Wishes.

—— Les pierres branlantes. (Ibid., 178–180.) Brief account of "rocking-stones" and their distribution in France, legends as to their origin, etc.

Semkowicz (W.) Krakowiaki. (Wisła, Warszawa, 1901, XV, 202–204.) Gives 29 specimens from the village of łęki (district of Brzesć) of Cracovian songs.

Smólski (G.) O Kaszubach nadlebianskich. (Ibid., 153–172.) A general account, with many references to the literature of the subject, of the Kassubes in the region of the Leba in northeastern Pomerania.

Sterling (P.) Przyczynek do badán nad początkiem kultu silnych. (Ibid., 173–176.) General discussion of the origin of the "cult of the strong."

Stieda (L.) Anatomisches über alt-italische Weihgeschenke. (Bonnet-Merkels Anat. Hefte, Wiesbaden, 1901, XVI, 1–83.) Treats of *donaria* or votive-gifts from the old temple of Æsculapius in Rome, from Veii, Cività Lavinia, Cività Castellana, etc., and also from a sanctuary of Diana in Nemi. These *donaria* are generally of reddish clay (sometimes painted) and consist of heads, half heads, eyes, ears, noses, lips, hands, feet, breasts, and organs of the abdomen, etc. They are representations of

Stieda—*Continued.*
healthy parts of the body, for the worshipper took care not to lay before the gods a diseased or deformed organ, lest their will might conform to that. As these clay objects are the work of ignorant artisans largely, they reveal no great anatomical knowledge. The article is illustrated with 4 plates containing 28 figures.

Swiney (F.) An ethical birth rate. (Westm. Rev., London, 1901, 550–553.) Discusses present birth statistics in England, and evidence of degeneracy in the youthful part of the population. Argues for making woman "not a race-producer but a race-developer." The "ethical birth rate" is four children per mother at intervals of six years between successive births.

Szombathy (J.) Un crâne de la race de Cro-Magnon trouvé en Moravie. (Anthropologie, Paris, 1901, XII, 150–157.) Paper read at Congress of 1900. Describes, with three text-figures and detailed table of measurements, a cranium from Fürst Johanns Höhle, near Lautsch in Moravia, which seems to prove the existence of the race of Cro-Magnon in central Europe in prehistoric times. The cranium, belonging to an individual of about 20 years of age, presents, with the exception of the high parietal bones of the skull of the old man in the Museum of Paris, all the characteristics of the Cro-Magnon type. If this find in Moravia is, as it seems to be, Quaternary, the antiquity of the race of Cro-Magnon itself is increased. In the discussion of the paper M. Verneau emphasized the great importance of this discovery.

Tetzner (F.) Das bosnische und herzegowinische Haus. (Globus, Braunschweig, 1901, LXXIX, 220–224.) This article, with thirteen text-figures, is based upon the larger work of Dr R. Meringer on the folk-house in Bosnia and Herzegovina. This region of Europe possesses houses of a remarkably primitive type,—cave-dwellings, pile-dwellings, one-roomed buildings, etc., and is of great interest to the sociologist.

—— Klete und Swirne. (Ibid., 252–255.) An historical-linguistic study (with five text-figures) of the Slavonic words *klete*, "granary," and *swirne*, a large sort of *klete* with "girls' room" and rooms for other groups of the population.

Thieullen (A.) Les pierres-figures à retouches intentionnelles à l'époque du creusement des valles. (Anthropologie, Paris, 1901, XII, 108–110.) Abstract of paper read at Congress of 1900. Treats of stones from the diluvian age suggesting certain animal figures which primitive man "retouched." The author certainly sees more in these specimens than the man of the drift ever could. In the discussion following, Sir John Evans and Professor Montelius expressed themselves as unconvinced, while the Abbé Breuil seemed more favorably disposed.

Thiot (L.) Notice sur la station préhistorique de Montmille, Oise. (Bull. et Mem. Soc. d'Anthrop. de Paris, 1900, V^e s., I, 440–446.) Describes briefly, with five text-figures, the early neolithic station of Montmille, in the department of Oise, the implements, etc., found there. The station belonged to a people acquainted with agriculture, and yet devoted to the chase.

Thomas (N. W.) Horses' heads, weather-cocks, etc. (Folk-Lore, London, 1900, XI, 322–323.) Brief notes, illustrated by four plates (28 figs.) from Petersen's work on the horses' heads on the gables of German houses, with reference to literature.

Vauvillé (O.) Puits néolithique pour l'extraction du silex sur Froucourt, commune, de Saint-Romain, Somme. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1900, V^e s., I, 483–485.) Brief account, with one cut, of a circular "well" or excavation at Frocourt examined in 1899, in which were discovered some relics (charred wood, pottery, etc.) of the neolithic period. This "well" and perhaps other similar excavations in this region seem to have been made for the extraction of flint.

Verneau (R.) and **de Villeneuve** (L.) La grotte des Bas-Moulins. Anthropologie, Paris, 1901, XII, 1–27.) Detailed account, with two plates and six text-figures, of the finds (ossuary, etc.) of 1898 in the Bas-Moulins grotto at Monte Carlo. The explorations were made by M. l'Abbé Janin, at the expense of the Prince of Monaco. The caves themselves, the burials, implements, and art remains, fauna, human

Verneau—*Continued.*
remains (portions of some 60 skeletons), are treated of. The skeletons indicate that these neolithic people were of a stature considerably lower than the average, brachycephalic generally, and not very robust. The brachycephalic crania of Bas-Moulins seem to resemble the Furfooz type No. 2, while the dolichocephalic skull recalls the Cro-Magnon,—this indicates a heterogeneous population probably related to the Ligurians.

Vetter (A.) Schwäbische Beiträge zu Blümml und Rott, Verwendung der Pflanzen. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 224–226.) Gives additional examples from Swabia of the use of plants by children,—in all seventeen items.

de Villeneuve (L.) See Vauvillé (O.)

Volkov (T.) Défense du mammouth gravée du gisement paléolithique de Kiev. (Bull. et. Mém. Soc. d'Anthrop. de Paris, 1900, v^e s., I, 478–479.) The author expresses the opinion that the carved mammoth-tusk discovered in 1898 by Khvoïka in a paléolithic situs in Kiev is "really a specimen of art of the Magdalène type." This relic proves not only the existence of Magdalenian art, but also that since the reindeer did not yet exist in this part of Russia, art served itself with the mammoth-tusk at an age when, in France, the horns of the reindeer were employed for like purposes.

Vorobjev (V. V.) O sootnoshenii mezhdu glavnêishimi razmêrami golovwî i litza tchelovêka i yego rostom. (Russk. Antrop. Zhur, Moskva, 1900, I, No. III, 83–99.) Gives, with three tables and six diagrams, the results of the investigation of 212 individuals from the Government of Rjäsan and 232 others (workmen) from the Government of Moscow, with respect to the relation between the chief head and face measurements and those of stature. The author refers in comparison to the studies of Anutchin, Erismann, Rozhdestvensky, etc., the last somewhat in detail. The most interesting general conclusion attained is that tall individuals possess a head smaller in all its principal measurements, the head growing more slowly than the stature in every way. The head measurements seem to increase with stature less than the measurements of the face.

—— Velikorussii. (Ibid., No. I, 43–82.) An anthropological sketch of the "Great Russians," with bibliography (pp. 80–82), and six text-illustrations of types. Stature, form of head and face, etc., are considered.

Wateff (S.) Anthropologische Beobachtungen an den Schülern und Soldaten in Bulgarien. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1901, XXXII, 29–30.) Brief résumé of the results of the investigation of the color of skin, hair, and eyes of Bulgarian school children and soldiers by the Commission of 1896, which has undertaken to secure data for a monograph on the anthropology of Bavaria. The statistics are grouped after the Virchow model. Altogether 209,929 children 6–10 years of age, 20,810 children 10–15 years of age, 6,145 children 15–20 years of age from all grades of the schools (total 236,884 out of 258,368 school-children in all), and 31,469 (out of 35,000 in all) soldiers 20–25 years of age, were examined. Besides this the army-physicians took detailed anthropological measurements of 5,000 soldiers. Of the total number of children and soldiers examined 9.12% were blond, 47.39% brunette, and 43.49% of mixed type; the highest percentage of any one characteristic was white skin 64.74 (next to this brown eyes 59.76), the lowest, red hair 0.08 (next to this green eyes 0.67). The highest percentage of blonds for five-year periods of age was 9.94 at 6–10 years, the lowest 4.65 at 15–20 years; of brunettes 60.97 at 15–20 years, and 45.98 at 6–10 years; of the mixed type 45.47 at 20–25 years, and 34.38 at 15–20 years.

Weinhold (K.) Der Palmbusch in den Niederlanden. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 215–216.) Brief abstract of the literature of the subject.

—— Wochenzettel für den kärntischen Bauerntisch. (Ibid., 221–226.) Gives the peasants' bill of fare from Stockenboj.

Wennersten (O. V.) Gotlands fårmärken. (Medd. fr. Nord. Mus., Stockholm, 1898 [1900], 59–62.) Describes, with two text-figures, the sheep-marks in use in the Swedish province of Gothland, where oviculture has flourished since the fourteenth century. Hitherto sheep-marks have been reported from Iceland only.

Wiklund (K. B.) Om lapparnas sätt att hälsa. (Ibid., 39–48.) Discussion, with review of literature of the subject of formulæ of greeting in use among the Lapps. Widespread among the Swedish Lapps are certain corruptions of "god natt" (good night). Equivalents of our English "farewell" among both Lapps and Finns.

Wilke (Dr) Ein slavisches Gefäss mit Leichenbrand von Lössnig bei Strehla. (Verh. d. Berl. Ges. f. Anthrop., 1901, 39–43.) Discusses, with two text-figures, an earthen pot, noteworthy on account of having been made, apparently, without a lathe, and containing evidence of burial by incineration. If the remains are really Slavonic, the custom was probably borrowed from the surrounding Teutonic population.

Willame (G.) Les festins du tir de l'oiseau à Nivelles, Brabant. (Wallonia, Liège, 1901, IX, 84–87.) A brief account of the festivities in connection with the annual "shoot" at Nivelles.

Wilser (L.) Die Häuptlingsstäbe, bâtons de commandement. (Globus, Braunschweig, 1901, LXXIX, 80.) Abstract, with reproduction of illustrations, of the paper of Dr Schoetensack.

Witowt. Kilka przesądów ze wsi Turowa. (Wisła, Warszawa, 1901, XV, 177–183.) Alphabetical list of 111 items of folk-lore from the village of Turowa, district of Radzyń.

Zaborowski (M.) Industrie égéenne ou prémycénienne sur le Dniestre et le Dniepre. (Bull. et Mém. Soc. d' Anthrop. de Paris, 1900, v^e s., I, 451–456.) Brief résumé of recent investigations in the Dniester and Dnieper regions in Russia, where remains of the premycenian or Ægean culture have been found,—some 30 places in all have been noted (Horodnica, Bilcze Zlote, the cave of Werteba, Zielencze,— a neolithic village,—etc.) Zielencze, the author thinks, is "synchronous with the oldest Ægean civilization." The painted pottery of the Dniester—Dnieper region "proves indisputably the existence of commercial relations (maritime, fluvial) between that part of the world and the eastern Mediterranean, at an epoch when its indigenous population were still in the stone age and without intercourse with the more civilized peoples of Asia and Europe."

—— Crânes de kourganes préhistoriques, scythiques, drewlanes et polanes. (Ibid., 456–465.) Résumés, after Talko-Hryncenicz, the prehistoric and proto-historic craniology of the lower Dnieper region,—the people of the *kourgans* of the Ukraine. The measurements relate to 150 crania belonging to different periods. The author considers that these investigations confirm his own studies in virtue of which he recognized the dolichocephalic skulls as belonging to the oldest population, while the brachycephalic minority represented a later, foreign element, coincident with the arrival of metals, etc. The *Drewlanes* ("forest people") and Polanes ("plains peoples") were either Slavonic peoples or peoples who were Slavonicized at a very early period.

—— Le feu sacré et le culte du foyer chez les Slaves contemporains. (Ibid., 530–534.) After a few notes on fire-lore among the Hindus, Greeks, and Romans, the Ainos, Ossetes, etc., the author résumés Titelbach's brief article in the *Internationales Archiv f. Ethnographie*, 1900, XIII.

Zeller (G.) Bäuerliche Kraftspiele am Abersee. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 218–219.) Brief account of two remarkable games of physical strength ("rotten muscles" and "wood-splitting") in vogue among the peasants of the Abersee in Salzburg.

AFRICA

Andree (R.) Alte westafrikanische Elfenbeinschnitzwerke im Herzogl. Museum zu Braunschweig. (Globus, Braunschweig, 1901, LXXIX, 156–159.) Describes, with seven text-illustrations, a drinking-vessel, a horn, and four spoons, all carved in ivory. They probably came from old Benin, at the time when it was famous for such objects of art, and came into the possession of the Dukes of Brunswick late in the seventeenth or early in the eighteenth century, being transferred to the Museum later.

Calvert (F.) Ein neolithisches Skelet aus Ober-Aegypten. (Verh. d. Berl. Ges. f. Anthrop., 1901, 33–34.) Cites extract from *Daily Graphic* (London) of Nov. 22, 1900, containing brief notice of a skeleton found in a sandstone grave on the west bank of the Nile.

Girard (H.) Yakomas et Bougous, anthropophages du Haut-Oubanghi. (Anthropologie. Paris, 1901, XII, 51-92.) This interesting paper contains valuable anthropometric (3 pages of measurements of 30 Yakomas and 4 Bougous, besides data in text) and ethnographical (including a Yakoma vocabulary of some 150 words) details concerning the Yakomas and Bugus, two little-known negro peoples of the Upper Ubanghi, a tributary of the Congo from the northeast. The Yakomas appear to be small-statured, mesaticephalic (rather brachycephalic), the Bugus rather tall and dolichocephalic. The relations between stature and cephalic index among the Yakomas indicate a mixture of races, a duality of cephalic index among these small negroes, as Verneau maintained. Both tribes are cannibals, the custom being largely due, Dr Girard thinks, to gluttony. They are not so grossly fetishistic as the Coast negroes. In their mimic dances the sexes do not mingle. Adultery is said to be rare. These negroes are gay, affable, and easy to govern if the right way be taken.

Gorilla (Der) im Kamerungebiete. (Globus, Braunschweig. 1901, LXXIX, 147-148.) Brief description, with measurements and photograph, of the largest gorilla hitherto discovered (killed by H. Paschen in April 1900), and now in the Umlauff Museum in Hamburg. The height of the skeleton was 165 cm. (arm-stretch 280 cm.), and the cranial capacity 56.2 ccm.

Hartmann (A.) Der Göttersitz Nanganga und seine Zerstörung. (Ibid., 201-202.) Brief description of the holy-place of Nanganga (its priesthood and ceremonies) destroyed by the missionaries in 1899. Nanganga was situated on the eastern shore of Lake Tanganjika.

Hollis (A. C.) Notes on the history of Vumba, East Africa. (Journ. Anthrop. Inst., Lond., 1900, XXX, 275-298.) An interesting résumé of the history, as obtained from various aged informants, of Vumba (the chieftains of which began their rule in the thirteenth century A.D.) down to the present time, with an account of the *diwans* or rulers. The paper is accompanied by three maps and a pedigree of the *diwans* of Vumba. A mass of genealogical information, not printed here, is accessible in the library of the Institute.

Jacquot (L.) Légendes sahariennes. (Rev. d. Trad. Pop., Paris, 1901, XVI, 265-267.) Six very brief legends from the Algerian Sahara.

K. (R. T.) Unter den Fellachen Gosens. (Globus, Braunschweig, 1901, LXXIX, 105-108.) Brief account, with 6 text-figures, of a journey among the Fellahin of the province of Sharkiyeh, the Land of Goshen of the Bible. Markets, water-places, religion, marriage, harvesting, etc., are referred to. The author notes the robust forms of the Fellahin, the droll babies, the early marriages, etc.

Leue (A.) Uha. (Ibid., 53-55, 76-78, 92-94.) This account of the Uha country in German East Africa, contains notes on the Waha, a Bantu people, the chief Mtale and his villages, the kingdom of Kihitia, etc.

von Luschan (F.) Zur anthropologischen Stellung der alten Ägypter. (Ibid., 196-200.) Discusses, with 10 text-figures, some aspects of comparative Egyptology. The oldest statues (from Negadeh, recently described by Naville) have a penis-cover like that of the Mobo in northern Togo, rather than the *nutschi* of the Kaffirs. Dr von Luschan does not favor Naville's new attempt to connect the ancient Egyptians with the Bantu tribes, holding to the theory of Semitic relationship, as evidenced by language.

de Mortillet (A.) La circoncision en Tunisie. (Bull. et Mem. Soc. d'Anthrop. de Paris, 1900, V^e s., I, 538-543.) Describes (with two figures), after Dr A. Loir, the practice of circumcision among the Jews and Mussulmans of Tunis. With the two peoples, method, rite, ceremonial, etc., are different, and while the former circumcise at eight days after birth, the latter do so only at about the sixth year (except that when the elder brother is circumcised, all his brothers two years of age or over have to submit to the operation). Suction of the wound still survives among the Tunisian Jews, but has been abandoned in France and England, and is prohibited in Germany. Its abolition is now being sought in Tunis.

Müller (P. F.) Folkloristische Ewhetexte, Gē-Dialekt. (Globus, Braunschweig, 1900, LXXIX, 45–46.) Native text with interlinear German and (in most cases) free English translation of folk-lore items about the moon, the stars, the origin of the firmament, and the silly character of the people of old. Numerous explanatory notes are also given. The last item is Abderite enough–" Of old the people were so silly that if a fly alighted upon their body, they would take up a gun to shoot it off." The author is a missionary in the Togo country.

Ponyaud (A.) Aperçu ethnographique sur la Tunisie. (Bull. Soc. Amis d. Sci. et Arts de Rochechouart, 1900, X, 67–71.) Concluding portion of notes on Tunisian ethnography. The author observes that unity of civilization (all Tunisian peoples aboriginal and foreign, except the Jews, have adopted Islam) has not yet involved unity of race.

Seidel (H.) Neue Forschungen und Fortschritte auf Madagaskar. (Globus, Braunschweig, 1901, LXXIX, 55–63.) This article, with nine illustrations, treats of recent progress in Madagascar under the rule of General Gallieni, and contains notes on the Antanossy (the aborigines of the Mahalfy region), the Tanals (evidently possessing some Hova blood) and the Betsimisaraka (originally pure African).

Weeks (J. H.) Stories and other notes from the Upper Congo. (Folk-Lore, London, 1901, XII, 181–189.) Gives English text of two tales ("Concerning a Person,"—telling why women run away and how people became liars; "Concerning the Owl and the Partridge,"—telling why people are afraid of spirits), and notes about charms, *likundu* (or occult power), ordeals, drinking customs. Worthy of note is the custom of giving away the first fruits of one's skill in manufacture, farming, hunting, fishing, etc. In this part of the world when a man becomes drunk, "he sticks a leaf in his hair to show it, and then no notice is taken of any stupid or insulting remark he may make, or any business transactions he may enter upon." Some of the material of this interesting article, with other like matter, has been printed in a primer used in the mission school of the Monsembe Station.

ASIA

Aristov (N. A.) Etnitcheskiya otnosheniya na Pamirê i vŭ prilegayustchichŭ stranachŭ po drevnimŭ, preimutschestvenno kitaĭskimŭ, istoritcheskimŭ izvêstigamŭ. (Russk. Antrop. Zhur., Moskva, 1900, I, No. III, 1–74.) A valuable study, with abundant references to the modern literature of the subject, of the ethnology of the Pamir and the adjoining regions, after the data in ancient Chinese annals. The oldest inhabitants of the region of Pamir and Kashgar seem to have been a people closely related to the Tibetans, and they continued to possess it until about the first century B.C.

Barth (A.) Un ancien manuel de sorcellerie hindone. (Mélusine, Paris, 1901, X, 171–176.) Critical review of Caland's translation of the *Kançika Sûtra*,—there is a previous edition by Prof. Bloomfield of Baltimore.

Basset (R.) Notes sur les Mille et une nuits. Rev. d. Trad. Pop., Paris, 1901, XVI, 74–88.) This section of M. Basset's critical and bibliographical study treats of the tale of "The Sleeper Awakened." The first part of the story, the author thinks, is an elaboration of the "If I were king" theme; the second (absolutely independent of the first) is probably based upon a real incident in the life of Abu Dolâmah.

—— Contes et légendes Arabes. (Ibid., 108–109, 165–177, 240–250.) Nos. DVIII–DXLIX of brief Arab tales and legends of all sorts. French text with bibliographical notes.

Butler (H. C.) Report of an American archæological expedition in Syria, 1899–1900. (Amer. Jour. Archæol., Norwood, Mass., 1900, IV, 415–440.) Treats of investigations in the mountain divisions of northern central Syria, in continuation of the researches of de Vogüé, 1861–1862. Sculpture, architecture, inscriptions (Greek, Latin Syriac, Hebrew, Palmyræan, Nabatæan, Safaïtic, Kufic,—Arabic,—) are referred to. Some of the *graffiti* found are of unusual importance. The full results of the expedition will shortly be published. The material is to be stored at Princeton University.

Carus (P.) Seven. (Open Court, Chicago, 1901, XV, 335–340.) First part of an illustrated discussion of the sacred number seven in relation to the religion and mythology of Chaldea, Egypt, Palestine, etc.

—— The Babylonian and Hebrew views of man's fate after death. (Ibid, 346–366.) General account with numerous citations from Hebrew and Babylonian writings and records. The author attributes the absence of a cult of immortality in the Old Testament to the redactors of the Hebrew canon, who, "since the belief in immortality, as expressed in the Assyrio-Babylonian legends, cannot easily be extracted from the Babylonian religion without retaining at the same time a good deal of the mythological elements, preferred to omit the whole and embraced an attitude of positive unbelief rather than defile the Scriptures with paganism."

Crowfoot (J. W.) Survivals among the Kappadokian Kizilbash. (Journ. Anthrop. Inst., Lond., 1900, XXX, 305–330.) This paper, accompanied by a map, two plates of portraits, and tables of cephalic measurements of 15 subjects, treats of the Bektash or Kizilbash ("Red Heads") of two villages in the province of Angora, a pre-Osmanli people, whose religion and marriage customs in particular show many survivals from the pre-Islamic period. Indeed Kappadokia now contains many fragments of a pre-Islamic civilization; these people were *sui generis* before the time of Alexander, and Greek, Persian, and Islamic culture have all failed to change them completely.

Evans (A. J.) Mycenæan Cyprus as illustrated in the British Museum excavations. (Jour. Anthrop. Inst., Lond., 1900, XXX, 199–220.) This paper, illustrated with fourteen text figures, deals with the results of the Turner Bequest excavation in Cyprus, which have made possible for the first time "a clear insight into a distinct and highly important phase of the insular civilization." According to the author the impress of the Ægean element is so strong "that we find ourselves in presence not of sporadic influences or isolated importations of objects, but of a distinct period in the insular civilization to which the name Cypro-Mycenæan must henceforward be given." In Cyprus the Mycenæan civilization survives to a later period than in Greece proper.

Frederichsen (M.) Professor Futterers Reise durch Asien. (Globus, Braunschweig, 1901, LXXIX, 188–194.) This article, illustrated with eight text figures, contains some notes (pp. 192–194) on the Tangut, a people of northeastern Tibet,—the Amdo, as they call themselves, Tangut being their Mongol name.

Furness (W. H.) See Hiller (H. M.)

Gardiner (J. S.) The natives of the Maldives. (Proc. Cambridge Philos. Soc., 1900–1901, XI, 18–21.) Brief geographical - ethnographical sketch. The author holds that the Singhalese and the natives of the Maldives "seem to have been the result of a dichotomous branching of a common stem, one division perhaps travelling along the west coast of Hindustan to Ceylon and the other sailing through the Laccadives to the Maldives,"—the Maldivian tongue appears to be related to ancient Singhalese. In historical times there has been "comparatively little admixture of races" in the Maldives. The people of the northern atolls "approximate closely to the Mahommedans of the south-west of the Peninsula"; in the central group Caucasian, Malay, and Negro elements are recognizable; in other parts, the people "very closely resemble village Singhalese." At the beginning of the thirteenth century the Maldives are said to have been converted to Islam, but both Christianity and Buddhism have also left traces. The Maldivians "have no stories of the origin of their race nor islands." An outrigged boat, found on one of the islands, "is now only used by the children as a toy, but formerly it was in common use for inter-atoll voyages." The term *faranje*, now applied to all western peoples, keeps green the memory of the French. The Maldivian language enjoys the honor of furnishing English with the word *atoll*. According to Mr Gardiner *atolu* in Maldivian signifies "province," and "these provinces are often conterminous with the *atolls*, whence arose this term."

Hiller (H. M.) *and* **Furness** (W. H.) Notes of a trip to the Veddahs of Ceylon. (Bull. Free Mus. of Sci. and

Hiller *and* Furness—*Continued.* Art, Phila., 1901, III, 69–87.) Brief account, illustrated with thirteen plates of a flying visit to the aborigines of the *Bintenne* region of the Badulla-Nilgalla hills and a part of the east coast of the island,—"village Veddahs" and "rock Veddahs." The photographs rather belie the statement on page 78, "the most impressive thing about them was their inhuman apathy and lack of interest, a peculiarity of the lowest types of man." The features of the Veddahs, the authors thought, "are decidedly more Hindoo than Negroid or Mongoloid." Brief notes on physical characteristics, food, clothing, primitive industries, bows and arrows, fire-making, religion, dancing, are given. There are also some notes on the Singhalese, whose votive offerings at the time of the harvest festival are represented in one of the plates. The figure of a village Veddah boy opposite page 82 is significant, while the family group on plate 14 is of great interest. It is a curious fact that these primitive people, while acquainted with the fire-drill, also use matches. There are other instances of the effect of contact with civilization, such as the Buddhist charm-book in the house of the chief at Makulugulla, etc.

Ivanowski (A.) Yezidî. (Russk. Anthrop. Zhur., Moskva, 1900, I, No. III, 100–103.) A brief anthropological sketch (after Gorostchenko, etc.) of the Yezidis, a people of Kurdistan, who are probably Kurds, in spite of their present religious tenets. On page 101 are given the average measurements of seven children (10–11 years) and 33 adults (16–65 years), belonging to the Government of Eriwan. Although the Yezidis speak a Kurdish dialect, they have a theocracy and a caste system, unknown to the Kurds proper. They also deform the head of the new-born child by binding. They are mesocephalic with an average stature of 1633 mm.

ten Kate (H.) Eine japanische Rachepuppe. (Globus, Braunschweig, 1901, LXXIX, 109–110.) Brief note, with figure, on a "witch doll" from Japan.

Laufer (B.) Felszeichnungen vom Ussuri. (Ibid., 69–72.) Treats, with fifteen figures, of the petroglyphs on the banks of the Ussuri, a tributary of the Amur, of which an account was given in 1896 by their discoverer, Lieut. Alftan, in comparison with those discovered by the author on the Amur (see *American Anthropologist*, 1899, N. S., I, 746–750).

Marnet (M.) Les castes dans l'Inde. (Bull. Soc. Amis d. Sci. et Arts de Rochechouart, 1900, X, 73–77.) First part of general discussion. Author holds that a caste-system or the beginnings of one can be noted among all peoples of Aryan stock.

Martin (W. A. P.) Poetry of the Chinese. (N. Am. Review, N. Y., 1901, CLXXII, 853–862.) General account, with specimens in English rendering.

Myres (J. L.) A primitive figurine from Adalia. (Jour. Anthrop. Inst., Lond., 1900, XXX, 251–256. Describes (with plate) a female figure in black clay, closely resembling that of the earliest Hissarlik pottery, obtained in 1900 from Adalia in Asia Minor. The position of the figure is half sitting, half kneeling, with steatopygia. It may be compared with the "temple boy" attitude of votive sculptures on Cypriote sanctuary sites. The author assigns the specimen "close to the boundary between the latest Neolithic and the earliest Metallic Age," and concludes that it resembles closely the relics of "the phase of culture represented by the lowest settlement of Hissarlik.

Nikolskj (D. P.) O tchuktchachŭ Kolymskago okruga. (Russk. Antrop. Zhur., Moskva, 1900, I, No. II, 23–29.) brief account, after Bogoras, of the Tchukchi of the region of Kolymsk. See *American Anthropologist*, 1901, N. S., III, 80–108.

Ozaki (Y.) Yubana, die Heisswasserprobe in Japan. (Globus, Braunschweig, 1901, LXXIX, 128–131.) Brief account, illustrated with eight text-figures, of the half-yearly "Shinto miracle," the Yubana, or "hot-water ordeal," as performed in the Houshi Shinshukyo temple in the Kanda district of Tokio. The author inclines to the belief that "suggestion and thick skin" count for much in this ordeal.

Pelletier (Madelaine) Recherches sur les indices pondéraux du crâne et des principaux os longs d'une série de

Pelletier—*Continued.*
squelettes japonais. (Bull. et Mém. Soc. d'Anthrop de Paris, 1900, V^{e} s., I, 514–529.) Gives, with detailed statistics, the results of observation of 55 skeletons (from Set tsu, Isumi, Izi Jamachiri) belonging to the Stenackers collection. Cranio-femoral, cranio-mandibular, cranio-cerebral (89 skulls), humero-femoral, cnemo-crural indices, weight of crania, long-bones, etc., are considered, besides cranial capacity. Among other interesting facts the following are brought out: In skeletal development the Japanese woman is nearer the Japanese man than the two sexes of Europeans are to each other; for both sexes the cerebro-mandibular index is higher with Japanese; with the Japanese the right humerus is hardly heavier than the left; the cranial capacity of Japanese women is rather high, as is also the weight of the female femur. Some comparisons of the condition of the adolescential with the adult skeleton are also given.

Regnault (F.) Les terres-cuites de Smyrne. (Ibid., 467–477.) Brief account, with 21 text-figures, of a collection of terra-cottas (statuettes) from the ruins of Smyrna, largely house ornaments or vase-attachments, amulets, etc., and embracing a great variety of types. These interesting statuettes represent the Coroplasts of Smyrna, and besides normal attitudes and forms the grotesque and the pathological occur quite numerously. Some of the physiognomic types (a Chinaman; facial expression of pleasure, pain, etc.; facial deformations, cranial peculiarities and deformations, heads of idiots and degenerates) are evidently quite true to life. Representations of hunchbacks, pregnant women, gnomes, etc., are also found, while the figures of the sexual characteristics are often well executed. It must be remembered that Galen began his medical career in the schools of Smyrna.

Seland (N.) K' antropologiĭ zapadno-sibirskago krest' yanina. (Russk. Antrop. Zhur., Moskva, 1900, I, No. III, 75–82.) Gives, with two tables, the results of the measurements (stature, chest-girth, head, strength of right hand) of 241 soldiers (from Tobolsk, Tomsk, Perm, Semiretchje, Orenburg) at Verniye in Turkestan, where the author is resident as a physician. The type of the West-Siberian peasants is Slavonic, and eyelids, cheek-bones, and lips of the Mongolic type were not met with. The head-measurements are treated more in detail. The average pressure-strength (right hand) of 35 individuals from Tobolsk, 60 from Tomsk, 49 from Perm, 47 from Semiretchje, and 50 from Orenburg was 47.4, 49.2, 47.7, 49.2, 48.6 respectively, that of 23 women whose measurements are also given being 32. The average stature of the women is 1581 mm., as compared with 1683, 1689, 1667, 1694, 1636 for the five groups of men.

Stadling (J.) The people at the top of the world. (Century, N. Y., 1901, LXI, 511–520, 754–762.) This account of a search for Andree in Siberia contains notes on the natives on the Taimur, Lena, etc.,—shamans, property, marriage customs.

Stenz (P.) Die Gesellschaft "vom grossen Messer," Boxer. (Globus, Braunschweig, 1901, LXXIX, 9–12.) Brief account (with reproduction of a page in colors from the "Book of Prophecy") of the now famous society of "Boxers." The author is a Catholic missionary, and the paper is of more than passing interest.

Sternberg (L.) Ueber die Giljaken. (Verh. d. Berl. Ges. f. Anthrop., 1901, 36–39.) Brief account of observations during several years' residence among the Giliaks of the Amur. The author considers the Giliaks an isolated people (by language, customs, etc.) with possibly American affinities,—they are certainly of northern origin. They seem to be "almost one with the Aleuts." Among the 4,500 Giliaks, there exist two principal dialects, divided into five or six lesser ones. The physical features of these people have changed more than their mental characteristics. Beneath a somewhat stolid face the Giliaks hide a rather merry and sociable nature,—their women are even acquainted with coquetry.

Talko-Gryntzevitsch (Y. D.) Drevnie obitateli Tzentral'noi Azii. (Russk. Antrop. Zhur., Moskva, 1900, I, No. II, 1–11.) A brief ethnological sketch of the ancient peoples of central Asia, Turko-Tatars and Mongols, who came into contact with Shamanism, Islam, Buddhism, Christianity, and underwent

Talko-Gryntzevitsch—*Continued.* not only physical but also linguistic intermixture, so that now one finds even a Turkic people with Mongolian speech and Hindu religion. The evidence cited by the author comes from the investigations of burial-places and the accounts in Chinese annals.

Venkataswami (M. N.). Hindu notes. (Folk-Lore, London, 1900, XI, 218–219.) Brief items about monkeys, childhood marriage.

Zaborowski (M.) Mensurations des Tonkinois. Les dolichocéphales Chinois de l' Indo-Chine. Crânes Tonkinois et Annamites. (Bull. et Mém. Soc. d' Anthrop. de Paris, 1900, ve s., I, 319–328.) After a brief résumé of the work and opinions of Girard (who took measurements of some 2,000 subjects), Eitel (studies of the Hakkas), Piton, etc., and some ethnographic details, the author gives the measurements of an old Tonkinese skull, those of the skull of an Annamese mandarin from Tonkin after Néïs, of three Annamese after Mondière, one after Vinson, and one after d'Enjoy. It has been thought that there is in China an ancient Eskimo element, like the Tungus, whose analogues, however, are to be sought among the ancient people of the Baïkal region, or the Turko-Tatars, rather than among the Eskimo. There is considerable evidence now to indicate a prevailing dolichocephaly for a large part of the ancient population of China. The Annamites show traces of mixture with the dolichocephalic Moïs, whom they dispossessed, and there is evidence also of the presence of a sub-Caucasian type in this region.

—— La Chine et les chinois. (Ibid. 544–560.) This paper has appeared also in the *Revue Scientifique* 1901, 4e s., XV, 161–170. See *American Anthropologist*, 1901, N. S. III, 189.

Zachariae (T.) Zu Goethe's Parialegende. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 186–192.) A discussion, with bibliographical references, of Goethe's Paria-legend poem, which is based upon the story of Marlatale, a goddess of southern India. Goethe became acquainted with the legend from Sonnerat's book of Oriental travels published in 1783 in German.

INDONESIA, AUSTRALASIA, POLYNESIA.

Blumentritt (F.) List of the native tribes of the Philippines and of the languages spoken by them. (Ann. Rep. Smithson. Inst., Washington, 1899 [1901], 527–547.) Translated (with introduction and notes) by Prof. O. T. Mason from the Zeitschrift der Gesellschaft für Erdkunde zu Berlin for 1890. The article is illustrated with a colored map reproduced from the Boletín de la Sociedad Geográfica de Madrid for 1890 and with ten plates representing natives of the islands from the Hilder collection of the Bureau of American Ethnology.

Bouchal (L.) Bezoarsteine in Indonesien. (Mitth. d. Anthrop. Ges. in Wien, 1900, XXX, N. F. X, 179–180.) Brief references, with etymologies of native names, to bezoar-stones among Indonesian peoples. The term *ulâwu* or *kulâu*, with its connections, is cited from the dictionary of the Macassar language. Some *kulâus* are believed to keep old men alive, others to be of great virtue for the coïtus. The list of *kulâu* substances (not of all which can be called bezoars) is quite long.

—— Noch einige Belegstellen für Geophagie in Indonesien. (Ibid., 180–181.) Notes the occurrence of geophagy or earth-eating in New Caledonia, Nusalaut, Saparua, Ambona, Java, and Sumatra. Among the names for edible earth in Malay languages are *batu*, *poan*, *ampo*, (*tano*) *bange*, etc. In small quantities this earth seems to have medicinal or even nutritive properties, especially with women and children.

Chamberlain (A. F.) Philippine studies. IV. Father Kamel and his writings. (Amer. Antiq., Chicago, 1901, XXIII, 203–206.) Notes on the papers about the Philippines (fauna, flora, monstrosities, etc.) of Father G. J. Camel, a Jesuit from Moravia, resident in the archipelago in the latter part of the seventeenth century. After him the botanical genus *Camellia* is named.

Erdweg (J.) Ein Besuch bei den Varópu. (Globus, Braunschweig, 1901, LXXIX, 101–105.) Brief ethnographical sketch of the Varópu, of German New Guinea, a fisher-folk; also a list of 67 Varópu words and phrases besides a compara-

Erdweg—*Continued.*
tive vocabulary of 39 words in seven other languages of the country. The great hospitality of the Varópu is noted. The stately forms of both men and women distinguish them from their neighbors.

Foy (W.) Zur Ethnographie von Neu-Pommern. (Ibid., 47.) Brief résumé of recent literature.

Fraser (J.) Some Indian words of relationship used by the Australian tribes. (Amer. Antiq., Chicago, 1901, XXIII, 171–178.) In this second section of his paper the author discusses the philological, anthropological, and ethnological bearings of his theory of the existence of Indian (Hindustan) relationship-words in the speech of certain Australian aborigines, and that "a simple monosyllable *ka*, having a very simple meaning, viz.: 'with,' has spread itself from the banks of the Tiber to Samoa and Japan in the far east, and has given birth to very many derivatives by a simple modification of its original form or by simple accretions." According to Dr Fraser the Malays are "not the progenitors of the Polynesians, much less of the Australians."

Haddon (A. C.) A classification of the stone clubs of British New Guinea. (Journ. Anthrop. Inst., Lond., 1900, XXX, 221–250.) In order of simplicity Prof. Haddon classifies: Natural (or only slightly worked), ring, ball, ovoid, disc, flat (with notched edges), knobbed, pickaxe, and star-clubs. Of the disc and star and knobbed (particularly) there are many varieties. The study is based on the Ballentine collection at Pt. Moresby. The descriptive portion of the paper is followed by notes on the geographical distribution of stone clubs in New Guinea, some half dozen areas being distinguished. Two sketch maps and four plates (figuring 107 clubs) accompany this valuable article. Up the Mambare river, stone clubs have been imitated in pottery.

Moir (J. P.) Stone implements from Tasmania. (Journ. Anthrop. Inst., Lond., 1900, XXX, 257–262.) This brief paper, accompanied by two plates (nineteen figures), consists of extracts from a letter relating to stone implements found in various parts of Tasmania. According to Mr Moir, gravers, scrapers, and skinners occur in about equal proportions, while axes are much fewer, and large axes very few. The author has carefully examined thousands of implements, and remarks the absence of stones made to fit or use in a club or handle,—"every implement is made to fit the hand."

Mason (O. T.) See: Blumentritt (F.), Virchow (R.)

Krämer (A.) Der Purgierfisch der Gilbertinseln. (Globus, Braunschweig, 1901, LXXIX, 181–183.) This article interests the anthropologist by reason of the peculiar fishhook figured on page 182.

Parkinson (R.) Die Einwohner der Insel St. Matthias, Bismarck-Archipel. (Globus, Braunschweig, 1901, LXXIX, 229–233.) Brief ethnological sketch,—physical characteristics, dress and ornament, houses and utensils, food, industries, weapons (figures of 12 spears are given). The spears seem to be the highest artistic products of the natives, who possess no iron.

Pleyte (C. M.) Die Mentawei-Inseln und ihre Bewohner. (Ibid., 1–7, 24–32.) This well-illustrated (10 cuts from photos) article deals with the geography and ethnography of the Mentawei islands off the west coast of Sumatra, whose inhabitants are Malayo-Polynesians of a rather individual type. Among the topics briefly discussed are: Legends, names, language, food, dress and ornament, houses, hunting and fishing, agriculture, war, birth, teeth-filing, tattooing, wooing and marriage, death and burial, religion, cultus, priests, punän (*tabu*), oracles, administration, law and crime, music and dance, chronology, etc. The absence of betel-chewing and the existence of fishing with the bow and arrow deserve mention here. Real war also is unknown, only treacherous surprises of the Malay sort. The archery of these people is good, and they use Morse's secondary release. A sub-form of the *couvade* appears to prevail. Tattooing is a prerequisite for marriage,—women are less tattooed than men. Monogamy is the general practice; the chiefs, however, have sometimes several wives. For mourning the relatives leave off (in case of children for five months, for widows

Pleyte—*Continued.*
till re-marriage) their ornaments, flowers, etc. Religion is chiefly soul-lore. There are two souls (brain, flesh), a sensitive and a vegetative one, both of which reconstitute the man in the next world. There are also evil spirits or *anitu*, and good spirits, or *bulungan*. Both sexes may be priests. *Punän*, or tabu, is an integral part of the cultus. The four crimes are: Murder, poisoning, theft, and adultery, of which the first two are punished with death, which follows for the third only after three times disregarded warning. The adulterer can be slain by the injured party.

Regnault (F.) La physionomie dans l'art sauvage. (La Nature, Paris, 1901, 408–410.) Discusses, with four figures of Polynesian war-gods, the efforts of savage peoples to render in art the human face. The author holds that primitive peoples have succeeded better than is commonly believed in representing the human physiognomy.

Stokes (J. F. G.) The mat-sails of the Pacific. (Occas. Papers, B. P. Bishop Mus., Honolulu, 1900, I, 25–32.) General account, with one plate showing board for mat-weaving, of the manufacture and use of mat-sails among the islanders of the Pacific. Mats were used for sails because *tapa* or bark cloth, the only other available material, was not durable enough. The Pacific sails are compared with those of eastern Asia, and the fact noted that "the Chinese sail has retained its shape since the first visit of the Western civilizer, until very modern times." The natives of the Marquesas islands seem to have had better sails when Mendana visited them in 1595 than in Dalrymple's time two centuries later. Imitations of European sails also occur.

Virchow (R.) The peopling of the Philippines. (Ann. Rep. Smithson. Inst., Washington, 1899 [1901], 509–529.) Translated (with notes) by Prof. O. T. Mason from the Sitzungsberichte der Königlich-Preussischen Akademie der Wissenschaften zu Berlin for 1897. Illustrated with two plates showing three skulls. The same paper appears, without the illustrations, in the Popular *Science Monthly*, 1901, LIX, 257–265; 351–360. From the cave-skulls Prof. Virchow argues for "a very old, if not autochthonous, prehistoric layer of population"—pre-Malay.

Walcott (A. M.) Ray-skin rasps. (Occas. Pap., B. P. Bishop Mus., Honolulu, 1900, I, 32–33.) Brief account, with figures of the ray-skin rasps (now substituted largely by steel) more or less common throughout the islands of the Pacific. The Gilbert islanders, *e. g.*, had various grades of them for so shaping the edges of the boards of their canoes that when sewed together they would be water-tight. Of these rasps we learn "their effectiveness when new is quite as great as that of those brought by the white man."

Walkley (C. S.) Philippine funerals. (South, Workman, Hampton, Va., 1901, XXX, 211–213.) Brief illustrated account of civilized burials at Manila.

Winkler (*Capt.*) On sea-charts used in the Marshall islands, with notices on the navigation of these islanders in general. (Ann. Rep. Smithson. Inst., Washington, 1899 [1901], 487–508.) This valuable article translated from the Marine-Rundschau (Berlin) for 1898, is illustrated with fifteen plates from U. S. National Museum and other collections.

AMERICA

Boyle (D.) The paganism of the civilized Iroquois of Ontario. (Journ. Anthrop. Inst., Lond., 1900, XXX, 263–274.) A brief account of the pagan Iroquois (1000 in number) of Grand River reserve, Ontario,—"a condition of society in which paganism openly professed and practiced has existed side by side with Christianity for nearly three hundred years." The paganism of these Iroquois has been modified very little by their Christian brethren. Conservatism has preserved, with loss of origin and meaning, "in almost their pristine simplicity and crudity, the music, the songs, the dances, the speeches, and the ceremonies of old." More about these interesting people may be read in Mr Boyle's Archæological Report for 1898, where many valuable details, fully illustrated, are given.

Brosius (S. M.) Liberty or rations for the Indians, which? (South. Workman, Hampton, Va., 1901, XXX, 299–302.) A plea for political, economic, and social freedom for the Indian.

Brosius—*Continued.*

—— The communal system among Indians. (Ibid., 194–195.) Author holds that "the need of the hour is legislation prohibiting the further enrollment of children to become beneficiaries of tribal estate."

Burns (L. M.) Digger Indian legends. (Land of Sunshine, Los Angeles, 1901, XIV, 310–314, 397–402.) These last two sections of Mr Burns' paper record "the love-making of Quatuk (Coyote)," "the Rabbit and the Toad," and "the legend of Edoochme." The tale of how Coyote took a fog for the ocean and tried to swim it "is a general favorite." In the second tale the Rabbit gets the Toad to jump into the fire and get burned,—the Toad had killed the Rabbit's love, the little green Frog. The third tale is of an abandoned child, who performed wonderful deeds. He lies now turned (by himself) into stone in the bed of Salmon river, "with his arms and legs uplifted in arches." And today "the Indian boy who can swim through without touching will never be harmed by a grizzly."

Culin (S.) A summer trip among the western Indians. (Bull. Free Mus. of Sci. and Art, Phila., 1901, III, 1–22, 88–122, 143–175.) This interesting paper, illustrated with 27 excellent plates, gives details of ethnographic and ethnologic sort obtained during a visit in the summer of 1900 to the Sacs and Foxes of Iowa, the Shoshoni and Arapaho of Wyoming, the Bannocks of Idaho, the Utes of Utah, the Piutes of Nevada, the Hupa of California, the Makah and Yakima of Washington, the Umatilla of Oregon, the Siouan Indians of Montana and North Dakota. Mr Culin notes the inroads of white civilization on the Indians and the progressive abandonment of primitive customs and industries. Many items of great anthropological and folk-lore interest are contained in these pages,—at pages 20–22 are "Notes on the Shoshoni and Arapaho" by Rev. John Roberts. The pictures of Wa-pa-lete-hihi, the Umatilla (opposite page 166), and of the Umatilla Indian girl (opposite page 164) are well worth examining. If the brush does not render the Indian at his best, the camera may.

Drew (C. A.) Signs of degeneracy and types of the criminal insane. (Amer. Journ. Insan., Baltimore, 1901, LVII 689–698.) Discusses, with ten plates, eight cases in the Massachusetts State Asylum for Insane Criminals,—cranial characteristics especially. Author takes conservative stand and thinks significance of "stigmata of degeneracy" may be exaggerated.

Dubois (W. E. B.) The problem of housing the Negro. I. The elements of the problem. (South. Workman, Hampton, Va., 1901, XXX, 390–395.) Prof. Dubois approaches the problem by a study of the Negro's "African past," giving (with illustrations) a brief account of houses and huts in the Old World negro lands.

Durham (J. S.) Race traits and general culture. (Ibid., 302–305.) Author's thesis is: "Man in his relationship [historical] is, then, the beginning and end of this general culture; and the special culture has as its beginning and end the Negro in his relationships to the extent that the race experience in this country has been peculiar." The object of Negro education is "the eradication of those undesirable traits which have been the result of race experience, and the conservation of those traits which are desirable."

Ehrenreich (P.) Religiöser Glaube der Centraleskimos. (Globus, Braunschweig, 1901, LXXIX, 44–45.) Critical review of the article of Boas.

Flores (E.) Primeros pobladores del país de Anahuac. (Bol. Inst. Cient. y Lit., Toluca, 1901, IV, 74–82.) Concluding section of an historical sketch of the ancient people of Anahuac. Treats of the period from King *Totepeuh* in 875 A.D. to *Topiltzin* (1094), under whom the Toltec nation went to pieces.

Franklin (Christine L.) Color-introspection on the part of the Eskimo. (Psychol. Rev., N. Y., VIII, 396–402.) Discusses the importance of the facts revealed by Mr Rivers in his paper on "The color-vision of the Eskimo." The acute color-consciousness of the Labrador Eskimo has revealed to them that "red, yellow, green, and blue (and no other colors) are of a unitary character," a very remarkable "coincidence of scientific color scheme with an impersonal character of color experience." See Rivers (W. H. R.)

Gleason (F. D.) Dakota children. (South. Workman, Hampton, Va., 1901, XXX, 348–352.) Illustrated popular article. Treats of infancy, travel, schooling of Sioux children of the Rosebud agency,

Guevara (T.) Historia de la civilizacion de Araucanía. (Anales de la Univ., Santiago de Chile, 1901, CVIII, 3–82.) This section of Guevara's history of the subjection of Araucanía deals with the wars with the Indians from 1561 to 1598, including the second general rising of 1594–1595. During the battles of this period the Indians showed that they had made progress in the art of fortification and had studied well the tactics of the Spaniards. The number of horses used by them increased, and they began to exhibit skill in their management. A brief account of the military tactics of the Indians is given at pages 69–72. Dr Guevara points out the imitation of Spanish tactics, the use of cavalry, armor copied from that of the Europeans, etc. They also manifested moral progress and some augmentation of prescience. To this period belongs Captain Fernando Alvarez de Toledo's *Purén Indómito*, one of the historical poems of the conquest.

Halbert (H. S.) The derivation of Mobile and Alabama. (Amer. Antiq., Chicago, 1901, XXIII, 179.) According to the author the name *Mobile* represents an archaic form (*mowelih* or *mobelih*) of the Choctaw *moelih* meaning "rowers" or "paddlers." *Alabama*, he thinks, comes from the Choctaw *alba*, "vegetation (of the lesser sort)," *amo*, "to gather," referring to the *défrichement* practised by the Indians. This etymology of Alabama does not differ in sense from that suggested by Dr A. S. Gatschet in 1888 in his "Migration Legend of the Creeks,"—*alba ayalmu* "cleared thicket."

Harsha (W. J.) The pride of the Indian. (South. Workman, Hampton, Va., 1901, XXX, 264–268.) Author holds that it may be said of the Indian, "one main trait, if not the very central and moving trait, of his character is pride." This is an obstacle to converting and civilizing him, but wisely used, could lead him to higher and nobler things.

Holmes (W. H.) Review of the evidence relating to auriferous gravel man in California. (Ann. Rep. Smithson. Inst., Washington, 1899 [1901], 419–472.) This valuable article, illustrated with sixteen plates and five text figures, and critically reviewing the literature of the subject, is reprinted from the *American Anthropologist* for January and October, 1899.

Katzer (F.) Zur Ethnographie des Río Tapajós. (Globus, Braunschweig, 1901, LXXIX, 37–41.) This article, illustrated with 13 figures (implements, head-trophies, face-tattooing), treats of the Mauhés, Mundurukús, and 'Apiakás, tribes on the Tapajós, in Brazil. A brief word-list from the Mauhé tongue and a few words of the Apiakás are given, and the author makes some corrections of Coudreau's linguistic material from this region. Some of the stone implements are described in detail. Certain polished implements are now made by the Mundurukús but "only as ornaments and children's toys," and not for use, for which purposes similar objects of the European stone age were doubtless also made.

Krause (E.) Die Schraube, eine Eskimo-Erfindung? (Ibid., 8–9.) From the consideration of the imposition of the arrowpoints in their shafts (illustrated by 7 text-figures), the author concludes that the screw has been invented by the Eskimo. See von den Steinen (K.)

Laidlaw (G. E.) Wooden relics. (Amer. Antiq., Chicago, 1901, XXIII, 169–170.) After noting the occurrence of "fish-stakes," mat-beaters, mallets, etc., the author digresses to briefly describe some pits on hills, said by local Indian (Victoria Co., Ont.) tradition to have been built by the Mohawks for defensive purposes against the Algonquian Missisagas.

Lehmann-Nitsche (R.) L'Homme fossile de la formation pampéenne. (Anthropologie, Paris, 1901, XII, 160–165.) Abstract of paper read before Congress of 1900. The finds upon which the argument rests are bits of baked clay from the middle *löss* of the Arroyo Ramallo, and Alvear,—to these a human origin is attributed. (See *American Anthropologist*, III, 195.) In the discussion M. Albert Gaudry expressed the opinion that the remains from the

Lehmann Nistche—*Continued.* Eberhardt grotto in Patagonia belonged to a quite recent epoch, and M. Imbert observed that there was no synchronism of paleolithic evolution in South America and in Europe, the former lagging behind the latter.

Leighton (Margaret W.) The Haidah Indians. (Overland Monthly, San Francisco, 1901, XXXVII, 1083–1086.) Illustrated popular article. Totem-poles, tattooing, canoes, carving, gambling, feasts, houses, shamans, are briefly referred to. The author seems to favor an Aztec origin for these Indians, a view lacking proof.

Lewis (Frances W.) The Pueblo home. (South. Workman, Hampton, Va., 1901. XXX, 316–320.) A sympathetic popular account of the home-life of the Pueblo Indian, whose "home is on the whole a happy one."

Lummis (C. F.) A New Mexican folk-song. (Land of Sunshine, Los Angeles, 1901, XIV, 318–319.) Spanish and English text, with music, of *El Borrachito*, ("The Tipsy Fellow"), a folk-song of New Mexico, collected by Mr Lummis and arranged by the late Prof. J. C. Fillmore.

McCowan (S. M.) The story of Mahtotohpa, second chief of the Mandans. (South. Workman, Hampton, Va., 1901, XXX, 200–205.) Popular article illustrated by six drawings made by Hampton students. The picture of Mahtotohpa was painted by Catlin in 1832.

McDermott (Louisa) Indian pupils' ambitions. (Ibid., 401–405.) States results of investigations in six non-reservation boarding schools in Kansas, New Mexico, Oklahoma, Montana, and Colorado, where the pupils are "nearest to white children in culture, experience, and general knowledge of life," and where also they "speak English, are thoroughly trained in the ways of civilization, and look at life from the civilized standpoint." The statistics relate to 975 boys and 658 girls between the ages of 4 and 26. Naturally enough, it is found that "white children have the larger field of vision and higher ambitions," since these are largely school-suggested. Like white children, it is the girls who vary most.

McGee (W J) The old Yuma trail. Nat. Geogr. Mag., Washington, 1901, XII, 103–107, 129–143.) An interesting account, with 7 illustrations and map of the old Yuma trail in southern Arizona, its history, etc. The activity of the Amerinds in this region is noted.

Maclean (J.) Blackfoot amusements. (Amer. Antiq., Chicago, 1901, XXIII, 163–169.) A general account of the amusement-side of Blackfoot Indian life, songs, "teas," dances, gambling, foot-races, smoking, guessing-games, throwing games, swimming, etc. The texts (Blackfoot and English) of three brief songs (war, love, divorce) are given. According to an interpreter, "there existed an historical song, similar to the song of Hiawatha as recorded in "The Iroquois Book of Rites," but the only Indian who knew it is dead. The "tea feasts" are now quite a factor in Indian social life. Since the advent of the whites the great Buffalo dance has become "a begging dance." Like tea, cards for gaming were quickly adopted by the Blackfeet. The "smoke talk" was all-embracing and the topics innumerable. The game of "throwing the wheel," the Indians claim, was taught them by Napio, "the Old Man of the Mountains." The Blackfeet swim dog fashion.

Meeker (L. L.) Ogalala games. (Bull. Free Mus. of Sci. and Art, Phila., 1901, III, 23–46.) This article, illustrated with 26 text-figures, and accompanied by a vocabulary of Indian technical terms, treats of the games of Ogalala Indians of Pine Ridge reservation, "an isolated camp of full blood Indians." Men's games (great hoop, elk, buckskin hoop, moccasin), women's games (shinny, plumstone, deer-bone), boys' games (grizzly bear, wood shinny, whip top, etc.), girls' games, and play activities of a miscellaneous sort are briefly described. At pages 36–39 is an account of "games and sports of the boys and girls of an Ogalala camp in the summer of 1900, played for the writer's benefit." Pages 39–44 are occupied by a descriptive catalogue of the objects and implements used in these various games. Remarkable are the absence of whistling and the presence of "stopping the circulation in the hand" as an amusement.

Peabody (C.) The so-called "plummets." (Bull. Free Mus. of Sci. and

Peabody—*Continued.* Art, Phila., 1901, III, 125–142.) In this interesting article, illustrated with 9 plates and 2 figures in the text, the author discusses the various theories concerning the use of the prehistoric objects known as "plummets," in connection with fishing, the chase and warfare, textile work, hitting and grinding, ornament, superstition, drum-rattles, real plummets, game stones, phallic objects,—all of these uses have been suggested by one investigator or another. The author's conclusion is: "All things considered, many of the New England 'plummets' were originally sinkers, while some of the larger ones were used as pestles and some of the smaller ones as bolas; many of the Florida specimens were probably sinkers, while the smaller and better worked ones were used as ornaments. The California specimens have been proved to be, many of them at least, charm stones. The beautifully worked and symmetrical specimens from the central civilization were very likely, in the absence of any better theory, wearing weights. Other uses in connection with fishing, the chase, and domestic pursuits, may have been common." These "plummets" are found from Maine to California.

Preuss (K. T.) Kosmische Hieroglyphen der Mexikaner. (Ztschr. f. Ethnol., Berlin, 1901, XXXIII, 1–47.) This valuable article, illustrated with 214 figures, treats of such "cosmic" symbols in ancient Mexican picture-writing as the "butterfly-half-moon," eye, cross, and cognate figures, snail, etc., their varieties, significations, and inter-relations. These figures are symbols of earth-goddesses, gods of death, and the earth, and their appearance on representations of the gods Quetzalcoatl, Tezcatlipoca, Mixcouatl, etc., is discussed, and the opinion expressed that these deities were originally chthonic.

—— Mexikanische Thonfiguren. (Globus, Braunschweig, 1901, LXXIX, 85–91.) Discusses, with 59 text-illustrations, the little clay figures and heads of deities, etc., which form so characteristic a part of Mexican antiquities. These figures in clay represent: Earth, maize and water goddesses; Tlaloc and Quetzalcoatl, rain and wind gods; Xipe, earth god; Macuilxochitl, god of play and song, and his fellows; Tezcatlipoca as patron of the dance-house. Some of these figures may have served as private deities; others were used by the shamans and those who practised magic. Few, if any, were mere children's toys.

Purpus (C. A.) Felsmalereien und Indianergräber in Tulare County, Kalifornien. (Ibid., 216–217.) Treats of rock-mortars, petroglyphs, and burial places in the "Digger Indian" country. The author notes that, unlike similar "pictured rocks" in British Columbia, Lower California, etc., these petroglyphs lack figures of human beings, mammals, birds, etc. Details of a grave-opening are also given.

Putnam (F. W.) A problem in American anthropology. (Ann. Rep. Smithson. Inst., Washington, 1899 [1901], 473–486.) This discussion of the unity or diversity of prehistoric man in America, the address of the retiring President of the A. A. A. S., 1899, is reprinted from *Science*, Aug. 25, 1899.

Reik (H. O.) Report on the examination of the ears of 440 school-children. (Bull. Johns Hopkins Hosp., Baltimore, 1900, XI, 318–321.) Brief general report with tables and figures. Dr Reik thinks "normal limit" for hearing is now too low. Boys exhibit more aural anomalies than girls,—due probably in some part to rougher life, caps, hats, etc. The most rapid growth of the auricle seems to be in the earlier years, there being little increase after the fifteenth. The author endorses Dr Hrdlička's views about the occurrence of "abnormalities" among the normal classes of the community.

Rivers (W. H. R.) The color-vision of the Eskimo. (Proc. Cambridge Philos. Soc., 1901, XI, 143–149.) Reports results of examination (in England) of 18 (ten males, eight females) Labrador Eskimo with Holmgren's wools, and of a study of Eskimo color-terms, both lexical and those obtained by presentation of colors. In this brief but valuable paper many interesting facts are brought out: The definiteness (exceptional for primitive peoples) of nomenclature for green and blue, the absence of the tendency (common to most primitive languages) to confuse blue and black; the extensive use of qualifying affixes and the denoting of

Rivers—*Continued.*
differences of color by using modifications of a few color-names (a process not very common in primitive tongues, where colors are named after natural objects more frequently); a superiority of the women in color matching and naming (said to be rather unusual in low stages of culture). These Eskimo resemble the generality of primitive people in the prominence of red in color-nomenclature, the absence of a word for brown, etc. Very remarkable is the following statement: "If one excepts three words, *sinanuk*, *aχjangatuk*, and *kaijuk*, which were comparatively rarely used, all hues, shades, and tints of color were named by various modifications of the six words for red, yellow, green, blue, white, and black." Also this: "The Eskimo, however, told me that in the autumn they could see all the colors I had shown them in the hills of their country, and it is possible that where color is only a transient occurrence in the year's experiences [color does not appear largely in Eskimo dress or decoration], it may excite more attention and therefore receive more definite nomenclature than in those parts of the world where luxuriance of color is so familiar that it receives little notice." This paper emphasizes the need of thorough-going studies of the color-vision of the American aborigines, from which important psychological results may flow. See Franklin (C. L.)

Sanford (D. A.) Education for allotted Indians, (South. Workman, Hampton, Va., 1901, XXX, 309–312.) Argues the advantages of sending Indian children to the same schools as white children.

Shaler (N. S.) American quality. (Internat. Mo., Burlington, Vt., 1901, IV, 48–67.) A discussion of the chief qualities, physical and mental, of man as an inhabitant of the United States,—"as suited to our kind as in any part of the earth." The American environment has proved hospitable to the red, the white, and the black races in numbers amounting to millions in each case. Among the qualities noted by Prof. Shaler are: Confidence in fellow-men (resulting in kindliness), commonwealth-ideal, allegiance within allegiance (State and Union), lawlessness within the law (lynching), religious freedom, public education, democracy in the household, non-critical frame of mind. Of the ultimate outcome the author takes an optimistic view.

Sparhawk (Frances C.) The Indian industries league. (South. Workman, Hampton, Va., 1901, XXX, 336–339.) Brief account of the origin and objects of this league, which exists for the double purpose of "opening individual opportunities of work to individual Indians, and of building up self-supporting industries in Indian communities."

Steffens (C.) Die Verfeinerung des Negertypus in den Vereinigten Staaten. (Globus, Braunschweig, 1901, LXXIX, 171–174.) In this article, with four text-figures (6 representative negroes), the author argues against the so-called "refinement" of the physical characteristics (physiognomy in particular) said to be due to his American environment and contact with the whites. What changes can be noted are probably due to intermixture of white blood. He admits, however, the advance of the negro in certain intellectual and industrial directions which would have been impossible in the African habitat—a sort of "negro aristocracy" has been developed.

von den Steinen (K.) Die Schraube keine Eskimo-Erfindung. (Ibid., 125–127.) A reply to a previous article in *Globus* by Krause (q v.). Dr von den Steinen adduces evidence to prove that the Eskimo have simply imitated the European screw. The article has nine text-figures. We have here only sporadic and occasional uses of a device borrowed from the Europeans, not a real Eskimo invention.

Strebel (H.) The sculptures of Santa Lucia Cozumahualpa, Guatemala, in the Hamburg Ethnological Museum. (Ann. Rep. Smithson. Inst., Washington, 1899 [1901], 549–561.) This article, illustrated with 11 plates, is translated from the Annual of the Hamburg Scientific Institute for 1893.

im Thurn (E. F.) Games of the Red-men of Guiana. (Folk-Lore, London, 1901, XII, 132–161.) This paper, which is illustrated with three plates, is in part reprinted from the rather inaccessible Guiana journal *Timehri*. Among the subjects treated are: Imitation by children of their elders; the

im Thurn—*Continued.* "coming from town" dramatics of the Macusi children; "playing animal" (jaguar, monkey, *acoorie*, duck, anteater, trumpet-bird games); monkey-game of adult Arawaks; the Arawak *macquari* or whipping game (possibly a funeral rite),—a detailed description (pp. 141–150) is given; the Warau-shield-game or *taratoo* (used as an ordeal), and the *parasheera*, a ceremonial feast of the Partamonas,—the last two are described with some minuteness. By "games" the author means "the pleasurable exercise of any of the bodily or mental faculties without any other purpose on the part of the player than either developing the faculty exercised, or developing in the player a fervid state of mind—in this case generally for quasi-religious purposes." In Guiana games are practically the education of Indian children. By them they become men and women. Ball-play, the author tells us, "is almost unrepresented among these utilitarian Red-men. I never saw any ball-game except among the Arekunas of Roraima." Its use only by adults and its rarity alike suggest borrowing from some other people. The "coming from town" representations are very interesting and afford abundant scope for the primitive imagination. Some of the animal-plays involve great physical skill and mental acumen. The drinking of *paiwarie* has in these latter days turned the *macquari* game into a regular orgy. Indeed, except mere children's games, the Warau shield-game is "the only one not accompanied by drinking." The Waraus, the author suggests, "have never risen to the level of a good drink," but it is interesting to know that "the energy, emulation, and excitement shown by the Waraus, in their liquorless game, are at least equal to those shown by the paiwarie-filled game-players of other tribes."

Vivian (C. A.) Yosemite legends. (Overland Monthly, San Francisco, 1901, XXXVII, 1068–1075.) Poetical versions of five Indian legends of Yosemite valley.

Wilson (T.) L'antiquité des peaux-rouges en Amérique. (Anthropologie, Paris, 1901, XII, 41–49.) Accepting the unity of the American race as proved, and presuming that at the time of the first appearance of the Indian in the new world the stock counted but a few individuals,—Prof. Wilson argues great antiquity for the Red Man from his wide extension and large numbers (millions at the period of European discovery). The multiplicity of languages, the condition of civilization of the various tribes, the fixity of type, persistence of characteristic traits, variety of implements, the kitchen-middens (far older than any mounds), are other evidences of high antiquity. At least 2000 B.C. (probably much earlier) must be fixed upon for the appearance of the Red Race in America,—the immigration (from Europe?) took place in the paleolithic period.

Wortman (J. L.) The probable successors of certain North American primates. (Science, Lancaster, Pa., 1901, N. S., XIII, 209–211.) Author holds that not only are the extinct North American forms and the living South American *Cebidæ* similar, but "the one was the direct descendant of the other." Moreover, "had the conditions been favorable, and the southern barriers been sufficient to arrest further progress, we could believe that through stress of environment a much higher type of monkey, and possibly a man, might have been evolved in the Western Hemisphere in the manner so ingeniously suggested by Duncan."

NOTES AND NEWS

Anthropology at the University of California.—A department of anthropology has been established by the regents of the University of California. The work of this department, for the present, will be anthropological research and the formation of a museum. Mrs Phœbe A. Hearst has for several years been collecting a large amount of valuable material from the several expeditions she has established, particularly in Egypt, in Peru, and in California. These collections she gives to the University at Berkeley. The University has also a large collection from Alaska, presented by the Alaskan Commercial Company; and it is known that other collections are to become the property of the University when the museum is established. There are also now in the University many archeological specimens and human crania obtained from various parts of the state. For the storage and preservation of all this valuable material a temporary fireproof building of brick and iron is to be erected at once. It is believed that this action will also be an incentive to the friends of the University to provide the funds for a museum building adequate for the proper exhibition of the collections in all departments.

As an encouragement to others and as an expression of her great interest in the new department, Mrs Hearst, who is one of the regents and a most generous patron of the University, makes a gift of $50,000 a year for five years for anthropological research. This amount will be devoted to continuation of the work in Egypt and in South America and to obtaining Greek and Roman antiquities; also to a thorough research of the archeology and ethnology of California, with particular reference to investigations of the deposits from the supposed Pliocene gravels to recent times, with the object of discovering when man first appeared on the Pacific coast; also to a study of the many Indian tribes of California, their languages, myths, and customs. For this work several parties are already in the field.

At present there will be no regular courses in the department, but university lectures on special topics in anthropology will be given from time to time. The first of these lectures was delivered on September 20 by Prof. F. W. Putnam, who was invited to outline the purpose and scope of the new department and the methods of anthropological research. The second lecture was by Miss Alice C. Fletcher on the value of ethnological study. The third lecture, by Mrs Zelia Nuttall, was on the picture-writing of the ancient Mexicans.

Dr A. L. Kroeber and Mr P. E. Goddard have been appointed respectively instructor and assistant in anthropology with assignment for field-work among the Indians of California. Prof. J. C. Merriam of the paleontological department has been given immediate charge of the research among the gravel deposits. Dr P. M. Jones is engaged in archeological work with special reference to Santa Rosa island. An honorary advisory committee has been appointed by the regents, as follows: Dr Benjamin I. Wheeler, President of the University; Prof. F. W. Putnam, Chairman of the Committee; Mrs Phœbe Hearst; Miss Alice C. Fletcher; Mrs Zelia Nuttall; Dr Franz Boas; Prof. John C. Merriam. Mr J. G. M. E. d'Aquin has been appointed assistant secretary and executive officer of the department.

The Savage Progressive and the Savage Stationary.—Mr William Stetson Merrill, of Chicago, sends the following extract from an article on "Savages," by Rev. Joseph Rickaby, S. J., in *The Month*, a Catholic magazine, London, September, 1901, pp. 281–282: "Supposing all mankind to have been at some remote epoch[1] together down on the low level of savagery, it is a serious difficulty to conceive how ever they could have risen. The lowest savages that we know are not progressive races; it does not look as though a thousand years of existence would improve them. If we may trust the traditions of the indigenous races of America and other countries, whenever an improvement has been effected, it has been by means of strangers from without, superior persons, coming in upon and educating an inferior race. With all the world on a dead level of savagery there would be no superior persons. . . . This is one of the many difficulties of Anthropology. I have never seen it considered and met. If all mankind were Hottentots six thousand years ago, they would probably be Hottentots to this day; or (more likely) the breed would have died out I have a suggestion to meet this difficulty.[2] I opine that there are savages and savages: savages who are such merely by stress of circumstances, and other savages who have in their blood the elements of degeneration and degradation; in other words, progressive savages and stationary savages, just as a farmer might have on his land stock that he could improve in time, and bad cattle that can never be improved.

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[1] A very remote epoch if it be true that Egyptian civilization (to say nothing of Assyrian and Chinese) can be traced to some such date as 4500 B. C.

[2] I owe the suggestion to the sagacity of a friend.

How came these stationary savages to be? Principally, I take it, by gross violation of the natural law of marriage.[1] Other causes, as poverty and hardship, may have helped. The stationary savage then is a savage who has deteriorated, coming of better ancestors, and in his degeneracy has sunk so low as to become hopeless. If this be true—and I merely put it forward as an hypothesis to be considered—scientific enquirers are committing an error when they put together and fuse into one common mass of evidence all particulars that they find, no matter about what savages, and argue thence the common characteristics of the savage state. Instead of that, they should distinguish savage from savage, the savage progressive from the savage degenerate and unimprovable. I think the hypothesis worthy of consideration, because while there are many observed facts of savage life remaining savage, little or nothing has been observed—I do not say, nothing has been argued, but nothing has been observed—of savages actually making progress of themselves, unaided by any superior race. Moreover, observation of certain savages seems to show them destitute of all native aptitude for progress, when left to themselves. Are we not rash in taking any and every savage race that we encounter for a type of the ancestors of civilized man?"

Egyptian Mummification.—In a communication to Dr D. S. Lamb regarding the latter's article on "Mummies and Mummification" in the last issue of this journal, Dr J. E. Quibell, of the Museum at Gizeh, writes as follows:

"I thank you much for your paper on Mummification of which you have been so good as to send me a copy. I have read it with great interest and have one or two brief remarks to make.

"Page 296.—El Omra is a prehistoric site and Virchow reasons from a cemetery perhaps 3000 years later in date.

"Page 297.—The period is . . . 3300 to 3000 B.C. This was *the* mistake of the book. We observed correctly, but misinterpreted the evidence. It is now proved to everyone's satisfaction that these contracted burials belong to the First dynasty and earlier. Maspero only would omit the words 'and earlier.'

"Now, the greater number, by far, of these very early burials (archaic, prehistoric, First dynasty, or whatever they may be called) contain skeletons only. It was but in a single division of the Naqada cemetery that the dried-up bodies were found. Mummy-wrappings, bitumen, salt, are *never* found with them. They must be considered apart from the mummies of the later, classical Egyptian period. Indeed

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[1] The Zulus, I am informed, do say this of the inferior races about them.

I have observed in a series of cemeteries that mummification is *extremely rare* until the Eighteenth dynasty. We speculated when digging at Naqada as to how the dried-up bodies came into their peculiar condition, though I do not think anything much was printed. A man who worked with us there (Price) and who had had experience in Mexican archeology, suggested that the bodies had been artificially dried. Or, we thought, it is possible that in this part of the cemetery the ground has some peculiar property of preserving bodies from decay; but there was no obvious difference between this soil and soil near it which contained only skeletons.

"There *is* soil in Egypt in which bodies do not decay. There is a case known (Wilbour, a distinguished American Egyptologist, told me of it) of a Greek apothecary who died at Assuan in one of the last cholera outbreaks, and whose body, dug up and sold as a mummy by the Arabs, was recognized by his friends in Cairo.

"There is more evidence of these dried brains than is printed. We saw more than one pretty perfect at Naqada and *often* found the brain dried up to a red resin-looking mass, but broken. The rarity was *to find the convolutions well marked.* M. Legrain tells me that he found similar brains at Silsileh six years ago and I think I heard Dr Rivers (of St. John's College, Cambridge) say this year that he had seen one while he was staying at El Omra.

"I will try to get you one. I cannot be sure, but my position as Travelling Inspector of Antiquities may give me a chance."

Apache and Navaho Fire-making.—While among the White Mountain Apache last summer the writer had opportunity to collect interesting details with regard to fire-making. Having procured dried flower-stalks of *Yucca baccata*, an Apache visitor to our camp was asked to make fire with them. Without leaving his squatting-place on the ground, he took the sticks, selected the tapering upper portion of one of the stalks for a drill, polished off the inequalities formed by the leaf scars, and rounded the lower end by means of a sandstone picked up at his feet. The thicker portion of the stalk was chosen for the hearth. Another small stone, also picked up from the ground, having a rounded corner about the size of the end of the first finger, was ground against the hearth and soon reamed a cavity suitable for the reception of the end of the drill. A moment's search on the ground within a foot or so brought to light a bit of flint, which was used to saw the groove leading from the cavity down the side of the stick. Then he sank a stone to the level of the ground in order to insure stability for the hearth, set the hearth with the cavity over the stone, took the drill between his palms, and twirled out fire in the shape of a glowing coal held in the groove of the hearth. Reaching out, he picked up a piece of dry dung, broke it in two, knocked the coal between the pieces, blew it a moment, and the fire was assured. No attempt at speed was made, but the Indian maintained that with sticks of his selection he could have a blaze started in the time necessary for a match to burn out. As the "Alligator" match, a slow but sure sulphur variety used in this part of the world, will probably last for three quarters of a minute, the statement of the Apache seems plausible. The late Captain John G. Bourke stated that the Apache can grind out fire in ten seconds. The operation of fire-getting as noted here is refreshingly primitive, being carried on as though the white man had never existed. The drill is called *na-des-kia*, referring to the flowering stalk of the yucca ; the hearth is *kai-ets-o-se ;* and tinder, usually decayed wood from a hollow tree, *tchin-sish*. The word for fire is *ko ;* I make fire, *kod-nishi-ni*. When given a match to light their cigarettes, Apache women preserve fire against exigencies by igniting a little bunch of grass or leaves near where they sit.

Among the Navaho general acquaintance with the art of fire-making with the drill has passed away, only medicine-men practising it now. It is customary to set a small cylindrical piece of the wood of *Artemisia tridentata* (Navaho, *tsa*) in the end of the drill. The hearth is preferably the soft stalk of a large weed, while the tinder is of softened bast of juniper or cottonwood. Sand is usually put in the cavity of the hearth to increase friction. The drill is called *ól-kóñ ;* the hearth, *pé-ol-kóñ ;* and bark tinder, *azhi*. Flint-and-steel are called *tlésh ;* matches, *set-leshe*. The word for fire is *kóñ*. Fire is carried by clamping a coal between two sticks held in the hand.

WALTER HOUGH.

Andrew Ellicott Douglass. — Andrew Ellicott Douglass, who died at New York City, September 30, in his eighty-second year, was born at West Point, New York, November 18, 1819. His father was Major David Bates Douglass, and his mother the daughter of Andrew Ellicott, professor of mathematics in the West Point Military Academy. Mr Douglass was graduated from Kenyon College in 1838, receiving the degree of A.M. in 1841. At the close of his undergraduate course he engaged in business with the concern which subsequently became the Hazard Powder Company, and was elected its president in 1867. After a successful career he retired in 1876, henceforward giving much of his time and means to the study of Indian remains in the United States. Mr Douglass spent ten winters in archeological exploration of the Florida coast, locating over fifty mounds, many of which he excavated.

He gave particular attention to the study of the various implements employed by prehistoric man in America, with the result that during the twenty years following his retirement from active business, he gathered a collection of over twenty-two thousand specimens, which were presented to the American Museum of Natural History during the present year. This collection was arranged in various special classes irrespective of geographic distribution, but with the purpose of illustrating the varieties of each class and of solving the problems of their use. Of these specimens the several hundred hematite objects form what is perhaps the largest collection of its sort in the United States. The collection is exhaustively catalogued in that painstaking manner so characteristic of its former owner. Mr Douglass contributed to the *Bulletin* of the American Museum of Natural History, " A Table of the Geographical Distribution of American Indian Relics." He sought the literature of American archeology almost as assiduously as he did the objective material pertaining to the subject, consequently gathering a valuable library. He was a member of a number of organizations, among them being the Metropolitan Museum of Art, the American Museum of Natural History (of which he was a patron), the Anthropological Society of Washington, the American Ethnological Society, and the American Geographical Society. Mr Douglass was also a life member of the Anthropological Society of Paris and a fellow of the American Association for the Advancement of Science. In his death American Archeology has lost an enthusiastic devotee and a warm friend.

HARLAN I. SMITH.

Etymology of "Caribou."—The etymology of this word, which appears in French as early as the first quarter of the seventeenth century, and in English by the eighteenth, has always been uncertain. *Caribou* undoubtedly came into English from the French of Canada, and has been looked upon by some as not an Indian word at all, but the corruption of a French one. This view is given specious support by the fact that the Micmac word for horse, *tesibu*, is a corrupt form of the French *des chevaux*. Other etymologies, of more or less absurdity, varying from a derivation from an alleged French *cerf-bœuf*, to an identification with *carabao*, the Spanish-Filipino name of the East Indian buffalo, have been suggested. But it is altogether unlikely that the Indians would be under the necessity of borrowing a term to name an animal so characteristic of their habitat as was and is the *caribou*. If an Indian word, it is from the Micmac dialects that the origin of *caribou* must be sought. Indeed, most authorities have contented themselves with stating that such is the case. The Micmac word for *caribou* is *kǻlibů́'* or *kǻlibů́*. What is, apparently, the true etymology of the term has recently been pointed out by Dr A. S. Gatschet[1] in a note on the dice-game played with discs of caribou bone: "The cariboo is still frequent in the woods of Nova Scotia and New Brunswick, and is called so, *χalibû'* (in Quoddy *megali'p*), from its habit of shoveling the snow with its forelegs, which is done to find the food (grass) covered by the snow,—*χalibû' mulχadéget* (Micmac), 'the cariboo is scratching or shoveling.'" It would thus seem that *caribou* is really a Micmac word meaning "pawer, scratcher, or shoveler," in the sense indicated. This is a natural and satisfactory etymology.

A. F. CHAMBERLAIN.

The African Society.—Owing to the remarkable interest aroused by the writings and lectures of the late Miss Mary Kingsley with reference to the natives of West Africa, their customs and racial characteristics, it was decided some months ago to perpetuate her memory by the foundation, in London, of a society for the study of the special subjects in which she was a conspicuously ardent worker. An Association was accordingly formed under the title of "The Mary Kingsley Society of West Africa," donations amounting to £700 being collected, and branch societies being established on the West Coast of Africa. More recently it was decided to extend its scope, and accordingly its title has been altered to that of "The African Society"; for it is felt that the time has arrived for the permanent establishment on a sound footing of an institution devoted to the study of all subjects connected with the great continent. West Africa, however, from which the Society has already received much support and encouragement, will naturally receive its first attention. The Society hopes to become a working information bureau for Africa. Its first object will be the study of native usages, institutions, customs, religions, and antiquities, scientifically conducted but having a practical bearing on the life of the people and the development of the country. In the present condition of the continent it has become a matter of absolute necessity that Europeans should more than heretofore be made acquainted with the habits of life, the feelings and thoughts of the natives, the laws and customs which govern their daily life, the conditions of their land-tenure, and the tribal institutions which affect the labor market. Native arts and industries are equally deserving of study with a view to their possible development. Persons interested in the new organization may communicate with the Secretary, Mr Robert Sewell, 22 Albemarle St., London, W., England.

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[1] Bull. Free Mus. of Science and Art, Phila., 1900, vol. II, p. 191.

Poisoned Arrows for Blowguns.—The French *sarbacane*, the Italian and Spanish *cerbotana*, the Portuguese *gravatana*, and the German *Blasrohr* (blow-tube), is, according to Demmin (p. 468), *arbotana*, or rather *carpicanna*, derived from Carpi, the place of manufacture, and the Assyrian (*Kane*), Greek and Latin *κάννα* (*canna*), whence "cannon." This tube, spread over three distinct racial areas in southern Asia, Africa, and America, is used either for propelling clay balls or arrowlets, poisoned or otherwise. It is the *sumpitan* of Borneo, where Pigafetta (1520) mentions reeds of this kind in Cayayan and Palavan islands. The hollow bamboo is used by the Laos of Siam, and is preserved among the Malagasy as a boyish means of killing birds. Père Bourieu notes it among the Malaccan negrito aborigines, whom the Moslem Malays call Oran-Banua ("Men of the Woods"); the weapon they term *tomeang*. It is known in Ceylon, in Silhet, and on both sides of the Bay of Bengal. Condamine describes it among the Yameos (South American Indians); Waterlow and Klemm, in New Guinea, and Markham among the Uapes and other tribes on the Amazon headwaters. In the New World it is of two varieties—the long, heavy *zarabatana*, and the thinner, slighter *pucuna*. Finally, it has degraded to the "pea-shooter" of modern Europe. The principal feature of the weapon is the poisoned dart; it is therefore unknown amongst tribes who, like the Andamanese, have not studied toxics. (*Journ. Anthrop. Inst.*, p. 270, February, 1882. Burton on the Sword, p. 14, note 2.)

THOMAS WILSON.

A New Archeological Publication.—The Archeological Section of the Wisconsin Natural History Society will publish, at regular intervals, a six- or eight-page sheet to be devoted to Wisconsin archeology. By this means it is hoped to keep alive and further the interest of the students, educators, and collectors of Wisconsin in bringing about a better state of affairs regarding the preservation of the prehistoric monuments in the state. The present uninterested attitude of the legislators argues that, for a year or two, at least, no bill favoring a state survey can be introduced. It is therefore deemed best, at present, to band together all persons interested, until the time for action shall arrive, so that the project can be carried to a successful issue. The bulletin is to be the organ of the campaign for a state archeological survey. It will not trespass on the field of the journals now being published and which, being of a nature technically beyond the training of the state collectors, are not available for this purpose. It is intended to publish articles of local interest, general articles intended to train the average student, editorials favoring free study and preservation of antiquities, notes, contributions of state collectors and students, notices of books bearing on Wisconsin archeology; in fine, all matter which will make the bulletin of particular value to the archeologists of Wisconsin. Mr Charles E. Brown, of the Milwaukee Public Museum, is acting editor of the publication, which will be known as the *Wisconsin Archeologist*.

HARLAN I. SMITH.

Dr Walter Hough has completed an interesting and valuable exploration covering five months in northeastern Arizona, and has returned to Washington with large collections, mainly archeological, for the United States National Museum. Holbrook, Arizona, was the base of supplies, and from this point were examined a group of ruins thirty miles southwest, on the first ridges of the White Mountain plateau; three groups in the region of the Petrified Forest; five groups between Snowflake and Fort Apache; and the ancient Hopi ruins in the Jedidoh Valley series. In the course of this season's work Dr Hough made observations on more than fifty-five village sites, excavating in eighteen, and learning of the position of many others in the region. He also collected ethnological material from the Apache, Navaho, and Hopi. During the month of May the work was carried on at the expense of the National Museum; for the remainder of the season the outfit was furnished through the liberality of Mr P. G. Gates, to whose interest in American ethnology and archeology the extensive opportunities afforded are due. Mr A. C. Vroman of Pasadena, California, whose photographs of Southwestern subjects are so favorably known, was a member of the party during the exploration in Tusayan. The great hindrance to successful archeologic work in this region lies in the fact that there is scarcely an ancient dwelling site or cemetery that has not been vandalized by "pottery diggers" for personal gain. Dr Hough expects to present his results in a report on the season's work.

Phillips Academy, of Andover, Massachusetts, has received a large sum of money through the munificence of a gentleman and his wife, who wish their names withheld from the public, for the purpose of establishing a Department of American Archeology. It is the purpose of the committee having the new department in charge to erect a suitable museum which shall also contain recitation halls, offices, and a large reception room where the students may assemble afternoons and evenings. The late Dr C. F. P. Bancroft, Principal of Phillips Academy up to the time of his death, was to have been selected Principal of the new department; Dr Charles Peabody of Harvard is Honorary Director; Mr Warren K. Moorehead has been elected Curator. The department began its official life May 1st, with some 40,000 specimens from all parts of the United States. These have been selected by the Curator during the last six years for the founder. Dr Peabody and Mr Moorehead will deliver in the course of the season a series of lectures on various anthropological subjects. The purpose of the museum is not so much to conduct field explorations as to study the unknown types of artifacts now on exhibition in the various museums, including those in the Andover collection.

Dr L. Serrurier, teacher of geography and ethnology in the Gymnasium Willem III, at Batavia, Java, died in that city July 7. Dr Serrurier was the first salaried director of the Royal Ethnographical Museum at Leiden, serving in that capacity from 1891 to 1896, when he resigned. During his services for this museum, which commenced in 1887, its work was greatly promoted. To him was due the remarkable increase in the Indonesian, Japanese, African, and American collections; he also established the department of anthropology of the museum as well as its library, and laid the foundation for its fine photographic collection. Dr Serrurier's continuation of Hoffmann's Netherland-Japanese Dictionary, as well as important works on Javanese magic and Japanese bibliography were unfortunately not finished at the time of his death.

Anthropological Society of Paris.—Although its first meeting was held May 19, 1859, it was not until the issuance of the ministerial decree of January 10, 1861, that the "Société d'Anthropologie de Paris" was formally recognized and approved by the authorities. At the suggestion of M. Chervin, its president, the Society celebrated its fortieth anniversary by a banquet on March 12, at the Palais d'Orsay hotel, which was presided over by the Minister of Public Instruction, and graced by the presence of representatives of various foreign anthropological societies. Two days afterward M. Chervin gave a dinner to the distinguished men of science who had been present at the banquet. As a result, a committee of the Society on "international relations," with Dr Verneau as chairman, was appointed.

Father William Pope.—News has been received of the death of Father William Pope at Regla, near Havana, Cuba, about July 1, aged about sixty. For many years Father Pope resided as a missionary among the Maya Indians of Yucatan, whose language he spoke with greater fluency than probably any other American. He was also a thorough Spanish scholar. On the outbreak of the war which has resulted in the final subjugation of the Mayas he, with other missionaries, was ordered out of the country by the Mexican government and came to the United States in time to join the first expedition to Cuba as official translator. Later he acted as chaplain at Santiago de Cuba and was in charge of a congregation at Regla at the time of his death.

JAMES MOONEY.

Dr León's Studies.—With the recent establishment of the Section of Anthropology and Ethnography, in charge of Dr Nicolas León, the noted Tarascan specialist, the National Museum of Mexico seems to have taken on new life. Within the last few months Dr León himself has published under the auspices of the Museum a bibliography of somatologic works relating to Mexico,—in which we note several names well-known in this country,—and a classification of Mexican linguistic stocks, while an ethnographic map of Mexico and a study of the Huavi tribe of Tehuantepec are in preparation. A privately printed bibliography of Dr León's original papers, translations, and editings, including several now in press, aggregates over 150 titles.

JAMES MOONEY.

Dr Joshua Miller, president of the Arizona Antiquarian Association, died at Flagstaff, Arizona, July 23, 1901, after a brief illness, aged fifty-five years. Although originally of Missouri, Dr Miller was best known as an enthusiastic, tireless investigator of Southwestern archeology and ethnology, and had done much to arouse and keep alive the interest in such studies in Arizona. While for a long time he had been in failing health, the end came very unexpectedly, and in a letter written only a few weeks before his death he tells of excavations which he was then supervising and of his plans for a summer campaign with the Hopi, to continue his study of their peculiar ceremonies.

JAMES MOONEY.

Preservation of Caverns and Prehistoric Stations.—The Twelfth International Congress of Prehistoric Anthropology and Archeology passed votes asking for a law for the preservation of caverns known to have been inhabited by prehistoric man, and for the prohibition of unauthorized exploitation of them. The French Minister of Public Instruction, to whom the request was made, has declared that the law of March 30, 1887, and the decree of January 3, 1889, concerning the preservation of prehistoric monuments, cover the case and make special legislation unnecessary. A. F. CHAMBERLAIN.

Hollowing Pipe-stems. — In order to hollow out a pipe-stem in an emergency the Chippewaian Indians of the Northwest Territory and the Athapascan tribes of central Alaska take a stem three quarters of an inch in diameter and about six inches long, of willow, birch, or any soft wood, and cut a notch in all round as far as the first annual ring of growth. By patiently and carefully pulling and twisting, the first year's growth is drawn out from the center of the cylinder, making a clear hole. S. J. ENTRIKIN.

GREEK PROVERBS.—The collection of modern Greek proverbs and proverbial locutions, by Politis, now in process of publication by the "Marasli Library" in Athens, is a noteworthy compilation. Besides proverbs from literature, etc., the author, who is a professor in the University of Athens, has gathered over 18,000 from the people of the various parts of Greece. This work has been awarded the Zappas prize of the "Association pour l'encouragement des Études grecques," for 1899–1900. A. F. C.

RUSSIFICATION OF THE SYRJANS.—According to a report in *Globus* of a lecture by K. F. Shakow before the Russian Geographical Society, the Syrjans of the northern Uralian region are in process of complete Russification. This mania for everything Russian has its bad as well as its good side, and this too ready denationalization, while carrying with it certain material advancement, seems to entail not a little moral retrogression. A. F. C.

POLISH ZOÖLOGICAL AND BOTANICAL DICTIONARY.—The *Slownik nazwisk zoologicznych i botanicznych polskich* of E. Majewski, the two volumes (Warsaw, 1894–1900) of which contain 1438 pages quarto, represents the work of many years, and covers the field from the sixteenth century down. Some 42,500 Polish names are cited, besides nearly 3000 from other Slavonic sources. A. F. C.

DR FRIEDRICH S. KRAUSS, of Vienna, the noted Slavic ethnologist, has recovered from a severe prostration brought about by over-exertion as secretary of an organization for the relief of the oppressed Rumanian Jews, and expects soon to resume his investigations among the Serbs, Croats, and other South Slavic races. J. M.

SPELEOLOGY.— Beginning with March 5th, M. Martel, the well-known cave-explorer, has given at the Paris Faculty of Sciences a weekly free course on Speleology. Among other topics considered are the prehistoric stations of the Vézère. A. F. C.

DR WILLY FOY has been appointed director of the Joest-Rautenstrauch Museum at Cologne to succeed Professor Weule, resigned. Dr Foy was formerly an assistant in the Royal Museum at Dresden.

MR MARSHALL H. SAVILLE has been named Officier d'Académie by the French government in recognition of his archeological researches in Mexico for the American Museum of Natural History.

THE SOCIÉTÉ DE GÉOGRAPHIE of Paris has awarded the Pierre-Felix Fournier prize to Dr H. Deniker, in recognition of the excellence of his work, *Les Races et les Peuples de la Terre.*

DR ÉMILE CAREL VAN DER HELLEN, a member of the Dutch expedition to Portuguese West Africa, organized in 1884 by D. D. Veth, died in Mossamedes, Southwest Africa, June 4.

DR K. TH. PREUSS, known particularly through his important ethnologic researches in New Guinea, has been appointed directorial assistant in the Royal Museum at Berlin.

PROCEEDINGS OF THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON

JANUARY 8 TO MAY 18, 1901

January 8, 1901

The 311th regular and 22d annual meeting of the Anthropological Society of Washington was held in the assembly hall of the Cosmos Club, with President W J McGee in the chair.

The minutes of the 310th regular meeting and of the 21st annual meeting were read and approved. The reports of the General Secretary, the Secretary of the Board of Managers, and the Treasurer were read, accepted, and placed on file.

Two amendments to the By-laws were taken up, considered, and lost. An amendment to Article I, Section 6, was proposed by Dr D. S. Lamb, to be acted on at the next annual meeting.

This being the time for the election of officers for the ensuing year, the following were elected by ballot: President, W. H. Holmes; General Secretary, Hannah L. Bartlett; Treasurer, P. B. Pierce; Curator, Marianna P. Seaman; Members of the Council: Alice C. Fletcher, J. Walter Fewkes, J. D. McGuire.

Meeting adjourned.

H. L. BARTLETT, *General Secretary.*

January 22, 1901

The 312th regular meeting of the Anthropological Society was held in the assembly hall of the Cosmos Club. On account of the illness of President Holmes, Miss Fletcher, one of the Vice-Presidents, occupied the chair.

The minutes of the 311th regular meeting and the 22d annual meeting were read and approved. The Secretary of the Board of Managers announced the election to active membership of Mrs Sarah S. James, Victor Mindeleff, and Dr Immanuel M. Casanowicz, all of Washington, D. C.

An antique German clock was exhibited by Dr G. M. Kober. Mr W J McGee gave a brief account of the Topeka-Cocopa expedition into Mexico during the last autumn.

The paper of the evening was on "Philology" by Major J. W. Powell. (Major Powell's paper appears in the *American Anthropologist*, Vol. 2, No. 4, pp. 603–637.)

Meeting adjourned.

H. L. BARTLETT, *General Secretary*.

February 9, 1901

The 313th regular meeting of the Anthropological Society was held in the assembly hall of the Cosmos Club, the President, W. H. Holmes, in the chair.

The minutes of the last meeting were read and approved. The President announced the death of three members of the Society, namely, Col. F. F. Hilder, Mr Miles Rock, and Dr Samuel C. Busey.

Mr Paul Brockett exhibited a facsimile of an ancient Mexican codex and a modern Japanese book. A Peruvian mummy was unwrapped by Mr W. H. Holmes and Dr Walter Hough of the National Museum. The paper of the evening was "The Peopling of America," by W. H. Holmes.

Meeting adjourned.

H. L. BARTLETT, *General Secretary*.

February 26, 1901

The 314th regular meeting of the Anthropological Society was held at Columbian University, under the auspices of the Washington Academy of Sciences, when the annual address was given by Mr W J McGee, the retiring President of the Society. The subject was "Man's Place in Nature." (Mr McGee's address appears in the *American Anthropologist*, Vol. 3, No. 1, pp. 1–13.)

Meeting adjourned.

H. L. BARTLETT, *General Secretary*.

March 12, 1901

The 315th regular meeting of the Anthropological Society was held in the assembly hall of the Cosmos Club, with President Holmes in the chair.

The minutes of the 313th and 314th meetings were read and approved. Dr J. Walter Fewkes exhibited some historical documents, including one old map of what is now Arizona and New Mexico, made by the Franciscan friar Menchero; a copy of a map made about the year 1500 by Juan de la Cosa; and a manuscript by Alzate y Ramirez, being a description of the ruin of Xochicalco. Mr W. H. Holmes exhibited some instruments of torture from Hanover, and an iron frame used to inclose the body of a criminal sentenced to be "hung in chains," found in Virginia two years since.

The first paper of the evening was "Ethnology in the Jesuit Relations," by Mr J. D. McGuire. (This paper has been published in the *American Anthropologist*, Vol. 3, No. 2, pp. 257–269.)

The second contribution was an address on "The Cocopa Indians" by Mr W J McGee. The speaker described the physical characteristics and activities of the Cocopa Indians occupying the lower valley of the Rio Colorado, in both Sonora and Lower California. Special attention was given to the primitive agriculture of the tribe, in which aboriginal corn, beans, and squashes are planted and harvested, and to the manner in which this agriculture is conditioned by the annual freshets of the river. Attention was also given to the social organization of the tribe, and to the influence exerted on the tribal life by mortuary customs and other ceremonies. The Cocopa were discovered by Alarcon and Melchior Diaz in 1540. They formerly numbered thousands, but are greatly reduced. By their own estimates they reached one thousand in 1890, but little, if any, more than five hundred in 1900. The speaker gave the leading factor in their decline as undoubtedly the adoption of Caucasian clothing, which is unsuitable to their riparian habits and flimsy habitations.

Meeting adjourned.

H. L. BARTLETT, *General Secretary*.

March 26, 1901

The 316th regular meeting of the Anthropological Society was held in the assembly hall of the Cosmos Club, with Vice-President Lamb in the chair.

The minutes of the last meeting were read and approved. The Secretary of the Board of Managers announced the election to active membership of Mr George R. Davitt.

Mr William Palmer, of the National Museum, gave a practical illustration of the making of a life-mask. Dr Casanowicz exhibited some Assyrian seals from Hillah; also some magic bowls, or Jewish incantation bowls. Mr Holmes showed some remarkably fine stone knives.

The paper of the evening was by Dr W. W. Johnston, and was entitled "The Ill-health of Charles Darwin: its Nature and its Relation to his Work." (Dr Johnston's paper appears in the *American Anthropologist*, Vol. 3, No. 1, pp. 139–158.)

Meeting adjourned.

H. L. BARTLETT, *General Secretary.*

April 9, 1901

The 317th regular meeting of the Anthropological Society was held in the assembly hall of the Cosmos Club, with the President, W. H. Holmes, in the chair.

The minutes of the last meeting were read and approved. The Secretary of the Board of Managers announced the election to active membership of Henry D. Parson, Constance Goddard Du Bois, Paul Beckwith, George C. Maynard, and George A. Dorsey, and the reinstatement of Thomas C. Robinson.

Mr George C. Maynard exhibited a sun-dial used by the Indians of Labrador, a water clock of the seventeenth century, sand glasses of the fourteenth century, some time-keeping lamps, and a model of a time-keeping candle.

The subject of the paper of the evening was "The Immigration Question" by Mr Edward F. McSweeny, Assistant Commissioner of Immigration, Port of New York. The speaker alluded to the manifold causes of migration—famine, desire for conquest, ambition, religious persecution, political revolution, and love of gold (the most potent factor). Between 1790 and 1820 only 250,000 immigrants came to America; between 1820 and 1900 more than 25,000,000 left their homes as emigrants. While in former years most of the immigrants came from Ireland and Germany, now they come mainly from Austria-Hungary, Italy, and the Orient—including Greeks, Armenians, and Arabs. The latter are the most undesirable class we have to deal with on account of their laziness and criminal propensities. The races whose coming to America has been productive of the most good are those of strong religious faith, viz., the Germans, Irish, and Scandinavians; while most of the races now coming seem to have little care for religion of any sort. Wages have been highest during those years of the greatest immigration. The Federal Government took control of the immigration question for the Port of New York in 1890, and under the law paupers, idiots, insane persons, persons suffering from dangerous contagious diseases, and persons coming under contract to perform labor in the United States are forbidden to land, and the steamship companies are required to return them free of charge. The speaker recalled the fact that the decline of Rome dated from the rise of the alien races and advised this country to give careful consideration to the whole question.

Meeting adjourned.

H. L. Bartlett, *General Secretary.*

April 23, 1901

The 318th regular meeting of the Anthropological Society was held in the assembly hall of the Cosmos Club, with Vice-President McGee in the chair.

The minutes of the last meeting were read and approved. Mr C. H. Townsend exhibited some implements of the Polynesian *tapa* industry and explained the process of making *tapa* cloth from the bark of a species of mulberry tree; he also showed samples of the Hawaiian *tapa* cloth which displayed beauty and variety of color and design.

Mrs Zelia Nuttall presented two papers, namely, "Ancient Mexican Manuscripts and their Mode of Decipherment," and "Chalchihuitl in Ancient Mexico." Mrs Nuttall exhibited a facsimile copy of the ancient Mexican codex which she recently brought to light in England, and gave a brief account of its history and contents. She explained the principles of ancient Mexican pictography and drew on the blackboard a number of native hieroglyphs taken from various codices, and representing local and personal names. The native method was demonstrated by a series of examples of the manner in which Mexican scribes recorded the names and titles of Spanish viceroys and governors in hieroglyphs. (Mrs Nuttall's paper on "Chalchihuitl in Ancient Mexico" appears in the *American Anthropologist*, Vol. 3, No. 2, pp. 227–238.)

Meeting adjourned.

H. L. Bartlett, *General Secretary.*

May 4, 1901

The 319th regular meeting of the Anthropological Society was held in the assembly hall of the Cosmos Club with the President, W. H. Holmes, in the chair. The minutes of the last meeting were read and approved.

Mr W J McGee, in an address on "Poisoned Arrows," noted that the arrow-poison of the American Indian is magical or thaumaturgic or necromantic in motive. The speaker mentioned cases in which the brews of the aboriginal magician's were necessarily septic and hence sometimes effective in producing death; and he exhibited a bow made by a Pamunky-Tuscarora Indian, to which magical potency was believed to be given by a carved effigy head at one end — this head being provided with horns in order that the arrows shot from it might be penetrating, and with snake-rattle ear-pendants in order that they might be venomous. In use both this effigy and the arrows were treated with a brew, made by extracting the head-contents of a number of rattlesnakes and cooking them in an earthen vessel until the fat arose in a scum; this was set aside for ten days, after which it was ready for use. In connection with the discussion which followed, the speaker questioned whether any native American Indian ever produced a vegetal poison capable of effective use on arrows, and urged the extreme desirability of careful observation so made as to discriminate between the incidental septicemia apparently produced in some cases and actual toxic poisoning.

Mr Holmes exhibited a South American blow-gun obtained by Professor Stein's expedition up the Amazon, together with a belt of bark worn by the user of the gun and a bottle of poison for poisoning the arrows.

Dr D. S. Lamb presented a paper on "Mummies and Mummification, Especially of the Brain." (This paper appears in the *American Anthropologist*, Vol. 3, No. 2, pp. 294–307.)

Dr A. R. Spofford, Assistant Librarian of Congress, presented a paper on "Early and Rare Books Relating to American Indians." (Dr Spofford's paper appears in the *American Anthropologist*, Vol. 3, No. 2, pp. 270–285.)

Meeting adjourned.

H. L. BARTLETT, *General Secretary*.

May 18, 1901

The 320th regular meeting of the Anthropological Society was held in the assembly hall of the Cosmos Club, Vice-President Lamb in the chair. Minutes of the last meeting were read and approved.

The early part of the evening was devoted to memorials on members lately deceased: Memorial on Dr Samuel Claggett Busey, by Dr D. S. Lamb; on Col. F. F. Hilder, by Mr W J McGee; and on Miles Rock, by Mr William Eimbeck.

A paper on "West Indian Idols and Totemism" was read by Dr J. Walter Fewkes.

Meeting adjourned.

H. L. BARTLETT, *General Secretary*.

American Anthropologist

NEW SERIES

VOL. 3 OCTOBER–DECEMBER, 1901 NO. 4

CLASSIFICATION OF THE SCIENCES

BY J. W. POWELL

All abstracts are concomitant in pentalogic groups to constitute the concrete. The pentalogic groups in the individual are always found in pentalogic series in the species. Thus a species is a class of individuals constituting a kind and a series. Species may again be regrouped into higher classes which we call genera. A genus is a group of species constituting a class of a higher order which is also a series, the genus itself being pentalogic in kind and pentalogic in series; and however far we may thus generalize by regrouping into more comprehensive classes, forever we must observe that pentalogic kinds are found in pentalogic series. It is sometimes affirmed, and more often taken for granted, that a scientific classification is a creation of the scientific mind and not a discovery by the scientific mind. It is sometimes affirmed that there may be many valid classifications, and yet practically all scientific men repudiate the doctrine and are forever striving for a valid and final classification, realizing that there can be but one.

Two principles must be observed in classifying the sciences that may properly be seriated and coördinated. The first is the plan of organization by which bodies are incorporated; the second is the concomitance of the categories. By the first bodies are grouped, by the second categories are discerned by being properly identified and discriminated. By the first a science is coëxtensive with a group of bodies; by the second a science is coëxtensive with a group of categories derived from one essential. We may therefore speak of corporeal sciences and categorical sciences, the corporeal being concrete and the categorical being abstract.

In the corporeal sciences one class of bodies have relations to all other classes, so that it is impossible to explicate the class without, to some extent at least, explicating all. For example, in explaining mammals we find it necessary to explain their teeth, for different mammals live on different kinds of food, — one is herbivorous, and we must know why teeth have one form to masticate vegetal food; others are carnivorous, and we must know why their teeth have another form to masticate animal food; and in general we must discover the relation of mammals to other animals, to plants, to rocks, to fluids, and to solids.

In like manner every categorical science implicates the existence of the other categories found in the group of bodies under consideration. The professional investigator who has to deal fundamentally with one category cannot neglect the others, for they are needed to explain the phenomena with which he deals, and often his investigation extends to the others. The chemist thus sometimes seems to be a physicist, and the physicist sometimes seems to be a chemist.

In seriating the sciences into grand divisions it is pertinent and useful to observe that at each stage there seems to be a special evolution of one of the categories, so that one after another takes a leading part. In the molecules exhibited in nebulæ and other substances, number controls, and largely the science is expressed in numbers. In astronomy space takes the leading rôle, so that in this realm space is the chief theme. In geonomy motion leads the way, so that motion in its various modes is the central topic. In phytonomy time as causation steps to the front and heredity is the theme, for new individuals are seriated by heredity from generation to generation. In zoönomy judgment leads the way. Thus in each stage some one of the properties becomes so predominant as to mark a grand class as its own.

This may deserve another method of presentation. Nature expresses ultimate simplicity in organizing the bodies of the universe, molecular bodies being organized on a basis of unity, stellar bodies on a basis of extension, geonomic bodies on a basis of speed, plants on a basis of persistence, and animals on a basis of consciousness. While these essentials are found in them all yet organization proceeds by steps in this manner, for the purposes of nature are achieved by abstraction on a grand scale.

We thus have *nephelonomy*, which is the science of molecules or nebulæ as bodies organized on the categories of unity; *astronomy*, which is the science of stars organized on the categories of extension; *geonomy*, which is the science of rocks organized on the categories of speed; *phytonomy*, which is the science of plants organized on the categories of persistence; *zoönomy*, which is the science of animals organized on the categories of consciousness. This gives us the grand classification of the sciences of bodies; and we have nephelonomy, astronomy, geonomy, phytonomy, and zoönomy.

In the sciences of organized bodies we find them subdivided by abstraction into categorical sciences, which we call *chemology* or *chemistry*, *morphology*, *dynamology* or *dynamics*, *ontology* or *evolution*, and *psychology*. These are the grand categorical sciences of natural bodies considered as abstractions. Thus nephelonomy, astronomy, geonomy, phytonomy, and zoönomy are severally subclassified as abstract sciences. In this series of bodies we have discrete degrees of organization. There is one degree of chemology in nephelonomy, another in astronomy, still another in geonomy, a fourth in phytonomy, and a fifth in zoönomy. In the same manner we have five degrees of morphology, five degrees of dynamology, five degrees of ontology, and five degrees of psychology in the series. I do not propose names for these twenty-five sciences, for I fear that I have already strained my credit with those who may be offended with neologisms. Here I must call attention to the fact that in gases, fluids, solids, and plants, psychic attributes are usually grouped under the term "affinity," while only of animals are psychic attributes affirmed.

In late decades the study of the ether has given rise to a group of sciences to which I give the name *ethronomy*. We know of the ether only as a medium and by reason of its being a medium. In ethronomy science has discovered five abstracts: light which exhibits numerical relations, magnetism which exhibits space relations, heat which as energy is a mode of motion, gravity which is causation through ether, and electrolysis by which the affinities of bodies are controlled through the ether. I call these sciences *photology*, *magnetology*, *thermology*, *barology*, and *electrology*.

In mankind we have a group of animals of supreme interest. Human beings are set off from the lower animals by a discrete degree of organization, although the elements of this organization are discovered in brutes. Individuals are organized in corporeal bodies, but they are again organized in demotic bodies. This organization in demotic bodies constitutes, then, a grand class coördinate with those included in ethronomy, nephelonomy, astronomy, phytonomy, geonomy, and zoönomy. To the sciences which pertain to the study of mankind as animal bodies, and also to their study as demotic bodies, I shall give the name *anthroponomy*. Man is preëminently the psychic animal, so that human psychology is set over against the other attributes of man, which are grouped under the term somatology; therefore man studied as a human body gives rise to the science of somatology and the science of psychology. To these two sciences as a group I give the name *andrology*, while andrology and demology constitute anthropology, which is the customary term; but as the science is coördinate with the greater systems, I shall use the term anthroponomy.

Demotic bodies are ideally organized to promote purposes; such bodies are as real as they are ideal. The purposes we have shown to be pleasure, welfare, morality, expression, and opinion, which are concomitant in every human act. They give rise to esthetology, technology, sociology, philology, and sophiology.

Again, we have subdivided these abstract sciences of demology severally into five groups to which we will not give names, but content ourselves with suggesting that the terms used should have systematic terminations.

The validity of these classes is demonstrated in a former work, *Truth and Error*, and in subsequent writings in this magazine.

With this fundamental classification there go many subsidiary classifications in which some part of a science is viewed only with respect to a particular group of bodies or abstracts, or from a particular aspect or a restricted group of objects. Thus, in zoönomy there may be a science of vertebrates, or a science of articulates; there may also be a science of mammals or of birds; those restricted groups of bodies give rise to more special sciences. Again, in demonomy we may consider only tribal peoples, when we will have the science of ethnology, or we may investigate the particular artifacts found in ruins, tombs, etc., when we will have the science of archeology.

THE ABORIGINES OF THE PROVINCE OF SANTA MARTA, COLOMBIA

By FRANCIS C. NICHOLAS

During the last five years I have made extensive explorations among the Indians of the ancient Spanish Province of Santa Marta, Colombia (see map, page 649), where I found interesting remains of prehistoric peoples and the surviving remnants of once powerful tribes.

In a rare work bearing the title *Floresta de la Santa Iglesia Catedral de la Ciudad de Santa Marta*, written by Father Alvarez Don José Nicolas de la Rosa, in 1739, I have found an interesting account of the Indians as this Spanish priest knew them. The book records the history of the Roman Catholic Church in Santa Marta, and was authorized to be published by the ecclesiastical authorities at various dates, reaching its final approval in 1755 by Fray Pedro de Alva, M. R. P. M., of the Convent of San Felipe and of the Court at Madrid. It was reprinted at Valencia in 1833.

The book forms a stepping-stone to a study of the history and antiquities of the Indians of northern South America. I have made a nearly literal translation from its pages, and in conjunction therewith have recorded my personal observations on the Indians as they are found today—more than one hundred and sixty years after the time of the Spanish priest, who wrote more than two hundred and fifty years later than the date of the documents quoted in his history.

Following is a translation of portions of the work relating to the Indians of the Province of Santa Marta:

Customs of the peaceable Indians and of those who have been conquered, with the derivation of their names and the derivation of the term "demora."

The Indians are in general all called "Caribs" because of their horrible and abominable vice of eating human flesh, a custom even now continued by many of those who have been conquered. Of themselves they have distinctive names, and the Spaniards on conquering them gave the tribes names according to their different customs; for example, the Moscas (Flies), of Nuevo Reino, who were so numerous that there was not found a name more appropriate. The Moscas are of another diocese, and it is not intended to notice here other than the interpretation of the names of those Indians found in our Province of Santa Marta.

Before discussing their names it will be reasonable to give some account of the most ordinary customs of those who have been conquered and live in the villages of their different parishes subject to doctrine, vassalage, and *demora*, and, after considering what derivation is had in this word *demora*, to proceed to describe the non-pacified Indians of whom there are various tribes, such as Chimilas, Alcoholados, Aurohuacos, Guagiros, Cosinas, Tupes, Acanayutos, Pampanillas, Orejones, Motilones, and Pintados.

The word *demora* relates to the tribute that was imposed on the Indians after they were conquered, to provide for a watch and vassalage over them, the right to collect which was granted to the conquerors of the Indians and their descendants; and the conquerors later gave this right to the Church to provide for the maintenance of teachers, missionaries, churches, ornaments, bodily medicines, and other things that would contribute to the education and public health of the Indians, and this, in my opinion, is the subject referred to in the Royal Laws[1] established generally in the Indians' favor by our monarchs, who, as they are true Catholics, seek ever to elevate the spiritual welfare of a people so recent to their kingdom. At first the Indians paid twelve dollars each year in tribute, but later the piety and heavenly Christianity of our Princess became so permanently established in favor of these new vassals, that to relieve them of all possible difficulty or impediment in sustaining the doctrine, this tribute was reduced to the reasonable sum of four dollars per year, which to this day is paid by all the Indians of our province—reduced to that rate lest they forget the vassalage due their Majesties, and because of the embarrassment (cost) to acquire it, they forget the mysteries of our holy faith. The name of this tribute, in my opinion and in that of various prudent persons, is no other thing than the delay in its payment through the resistance of the Indians to the arms of Spain. This tribute, excepting only the caciques, all pay from the age of eighteen years till they are fifty-eight, the women being generally relieved from it, and likewise, with special regard, the captains, municipal governors called alcaldes, headmen, and other officers during the term of their office. Because of this payment, these Indians who live subject to doctrine, vassalage, and tribute, are commonly called *demorados*.

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[1] Lib. 6, tit. 5, *Nueva Recopilacion de las Leyes de Indias.*

The Indians of the Province of Santa Marta who live peaceably, paying tribute, are in their physiognomy like all others generally—of medium stature, squat, broad-shouldered, wide between the eyes, of equal thickness of waist and chest, feet and hands small but broad, toast-colored, hair black, coarse, and faded. They are quick for bad and slow for good, poor in spirit, and miserable but frank and unrestrained in their vices. They consume food in quantities when it is easily obtained, and sleep from the first darkness of the night till the cock crows. Before morning breaks they bathe and frequently repeat it through the day; and because of their passion for the water they have always their houses on the banks of the rivers, and naturally they are fine swimmers and ardent fishermen, the instruments for which are the most valued possessions of their houses, their poor industry inventing the traps, dragnets, harpoons, and hooks on which they employ the greatest care.

They have no beard nor any hair on the other parts of their bodies, and he who has it is reported of mixed blood among them, and is not recognized as an Indian. They believe among themselves that without them the Spaniards would be of little value, and are commonly heard to say, "What would the whites do without the Indians?"

Their most highly esteemed food is fish, and game from the forests, because these cost only the effort of fishing and hunting which is naturally so pleasing to them. In one or another viand they must have an over-abundance of salt, of which they are so passionately fond that whatever they may want for maintenance can be supplied by a ball of corn and a lump of salt. They have no vegetables except yucca, plantain, squash, potato or other roots, and satisfy themselves with the ball of corn. They eat twice a day, but the hunger between meals they satisfy by drinking, for which they are evilly disposed, drunkenness not being among them a bad sight, though they note it among the whites, having little estimation for those who are drunkards. Their ordinary liquors are chicha, guarapo, vacano, and palm wine. They make chicha of corn toasted and put to sour; the guarapo is molasses from sugar-cane mixed with water and left to ferment; the vacano is yucca cooked and masticated; and the palm wine is made from the sap of the curva palm. Needing so little they make their cultivation very small, the men only clearing the land, and it is then the obligation of the women — mother, sister, or daughter— to assist the men, gather the fruit, carry it on their backs to their houses, prepare it, bring the wood and water, stack the corn, and everything else. The man only hunts and fishes, but not after he has enough for the day. His wants supplied, he rocks himself in his hammock until the woman has prepared the meal.

The dress of the men is reduced to a short jacket and drawers of cotton muslin; the women, a white shawl and petticoat of coarse cotton. In their houses they always go naked from the waist up; only the caciques use shirts and foot-coverings, and their wives slippers to distinguish them from other women.

The industry for which the Indian is most useful is to drive and tend animals, or as a servant, fisherman, or boatman. The value of his work must be paid in advance or he will do nothing; and as the Indians are accustomed to drink viciously without providing anything for the support of their families, it is very little that they will do for useful industries.

The people of the coast spin cotton, weave hammocks and ropes, and make palm hats, fans, and brooms; others make pottery —some of good quality, but generally very ordinary—; many of the Indians raise hens and other domestic creatures, and they carry all these products on their backs to sell in the cities. The women of the interior country clean sisal, of which they make thread to knit sacks, saddle-bags, and slippers; and they have other industries according to the countries in which they live, with the result that the women are continually working, being much more agile and thrifty than the men.

To make less work in clearing the forest for planting, they have introduced a method of exchange called *chagua*, for which on one day all or part of the men of the town join together, each with his ax and machete, and among them all they clear the ground and leave it ready for sowing. The owner of the chagua must give them to eat and drink that day, and for this he provides by fishing and hunting, and his women supply abundant jars of chicha. This among them is a holiday, and they make it a feast, and on such days it is necessary that the priest should say mass early and have a care that they hear it. At night, if any drink remains, they form a dance which is continued until all has been consumed. They pay again in return, and if one of those who attended makes his chagua, the Indian who received the benefit must attend in his turn. They do the same when a house is to be built, and having brought together the material, which is timber, cane, vines, and palm-leaves, they can by a chagua make a house in two days.

When a child is to be born, the Indian woman shuts herself alone in her house, first providing two jars of warm water in which later she bathes with her child, and after bathing remains in her hammock for nine days and is attended by other women of the village; and if she makes any cry or complaint they hold her in offense. The child is named for the first bird that sings or animal that cries or growls after its birth, and among them the child is better known by this name than by the holy name given it in baptism. After the nine days the woman goes to the river and bathes with her child and remains out of the village, and she is then visited by all the Indian women. In place of a family name—except among the descendants of those families who have preserved their names since the conquest—they take the name of their owners or directors, as Majias, Hincapie, Bustamente, Nuñez, etc. If the owner whom the Indian serves has any other name or title, the Indian copies that name also, as Obispo, Gobernador, Contador, etc.

All these Indians speak Spanish with clearness, although with rather ordinary words; yet they have not forgotten their native tongue, which is distinct in each tribe according to the primitive races from which partially they descend. They use Spanish at times in their meetings, dances, and councils if one does not understand the language of the others. All generally use the bow and arrow for their hunting and fishing, and all are children of ingratitude and dishonesty; but considered as miserable, ignorant, and poor in spirit, they must be treated charitably that the root of the Catholic faith may become deeper among them, though now they are as a drop of water shut in a stone.

The Aurohuaco Indians are also considered peaceable because they live subject to the faith, vassalage, and demora in the Sierra Nevada between Santa Marta and Rio Hacha. These have various customs and less intercourse with the Spaniards. This name Aurohuaco we translate, in Spanish, Oro Escondido (Hidden Gold), because of very truth in these sierras is the Potosi of all the coast in richness of gold, silver, copper, lead, and a quantity of precious stones—not only in the tombs that the ancient Indians, progenitors of these Aurohuacos, made for their graves, but also minerals according to the veins that one finds in those mountains.

It is impossible to secure the graves, tombs, and hidden treasure, because the Indians threaten with death the first who tells of it; nor will they help to discover mines because of the difficulties that surround them. These Indians are those who need, more than all of the province, to hear the evangelical voice of St Louis Beltran, and according to tradition were those who were visited by the Apostle St Thomas, according to those who saw and communicated the first accounts of them. This is further indicated in their dress, which they use as the Apostle's,—a long robe of cotton girt about the waist. The rich among them wear a diadem of tortoise-shell, the poor a band of plaited palm above the forehead made in a semicircle and placed about the head to protect the eyes from the heat of the sun and to retain the hair. The face being humble and serene, and using but few words, they are by nature peaceable. They do not use bows and arrows, nor any arms, defensive or offensive. Their fights and quarrels cause one to laugh, because their mode of avenging grievances one with the other is to go out to a place agreed upon, where there is a rock or great tree, each one carrying his cane (a black stick made of the heart of an elastic, lustrous wood), and then they strike ardently at the tree or rock, meanwhile uttering a multitude of insulting words until one cracks or breaks his stick. To this one is accredited the victory, his enemy recognizing him as the braver; and, embracing, they return to their homes, renewing friendship and drinking.

The food of these Indians is fish, conches, and lobsters, which they catch in the sea, and, rarely, beef; they do not hunt, there being no animals or birds in their mountains because of the snow which freezes in those distant places. They mix the ball of corn with yucca, potato, or aracacha: they call it *naiboa*. It is of a different flavor from ordinary unleavened corn-bread, and is not so nourishing.

Their women do the planting, because the men are occupied in weaving blankets and sleeping-hammocks of cotton; or sacks, saddle-bags, and little hammocks of henequen. The thread for these things the Indians spin while being instructed in doctrine. The Indian women, when they go to the field to work and when they return from them, carry loads, greater or smaller; and, although they walk embarrassed with a young child in their arms, take a load of corn, vegetables, fruits, wood, or water, and manage it all because all is carried in a sack on the back, hanging from the forehead to free the hands. In the mountains inhabited by these Indians there is an abundance of products that are not found in other regions: fruits, flowers, vegetables, and medicinal plants, all of which are cultivated or gathered by the Indians and carried by the women in heavy loads suspended from the forehead.

The adornments of these Aurohuacos[1] in the celebration of their feasts, dances, and ceremonies are of the finest gold—earrings, bracelets, and necklaces,—though many of the poorest use ornaments of an inferior gold. The Aurohuaco women are accustomed to the bath when a child is born, as the others; and under the same circumstances give names of animals or birds, except if those who are not married give birth, then the child is reputed a bad animal and is so called, and the mother is so disgraced that no Indian will marry her.

They all have the vice of chewing jaya (coca), a leaf that they cultivate in their gardens; and they always have in their hands the poporo, which is a little calabash, highly polished, with a belt in the middle and a cord that holds it, and a little stick in the opening at one end. This vice they use by making very white lime of sifted shells, which they put in the poporo. The jaya leaves are carried, toasted, in a bag slung across the shoulder; they put a little of it in the mouth, and wetting the point of the stick, put it in the poporo, that it may receive the lime; they then put it in the mouth, and mixing it with the jaya, chew and swallow the liquor. This they repeat day and night, and so much that they are twirling the stick in the poporo all the day, and with the violence of the mixture create a shell around the teeth, more or less great according to the time they have used it. The Indian who quickest makes this circle is considered the most expert in the use of the jaya. This mixture[1] made to a powder is a cure for toothache, and for this they save it and sell it to the Spaniards.

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[1] Father de la Rosa spells it also "Orohuacos," but the previous form is here used throughout.

The Indians of San Sebastian, on the southern side of the mountains, have the same customs as these and are also taken for Aurohuacos because they live in the same snowy country, although more distant from the cordillera.

On one of the great streams where the Rancheria river passes the mountains, the Aurohuacos have a house of worship which they call *canzamaria*, and in which they have their idol formed of feathers of a variety of changeable colors. For its care a family live in that place, but always a little retired from the temple; and each month when the new moon rises, they go to celebrate their feasts and dances, where they respect nothing, and become grossly drunk; and when they have made the adoration they call it ***mohan***, and with whistle and cry call up the Devil (literally, the dead), who comes invisibly and is intróduced in the idol where it speaks and instructs them in their tongue, and they give answer in their native language. There are many canzamarias, each rich man having his own. The adorations and feasts are made by invitation of the principal people, and for these the Indians go one month to one and another month to another canzamaria successively all the year in the first two, three, or four days of the new moon; afterward they return to their cities laden with yucca, agrocacha, turmas,[2] apples, and other roots and fruits, their need of which is the real reason for their going. This feast the Aurohuacos call the *Mamaron*, that is to say, " Deep land" ; and the peaks of the sierra they call *chiviron*,—" inclined land."

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[1] Probably the jaya (coca) and lime.

[2] A word not understood now in the province; it may mean tumas, a kind of red bead found in the ancient graves and highly esteemed by the Aurohuacos of today.

The land about the canzamaria at the headwaters of the Rio Rancheria was the Pantheon where they buried the important Indians; there one can see more than eighty tombs mounted with stone, and in the plain about it various houses where they entertain those who go to the feasts. The road to go down to this temple passes over the highest of the mountains, and there is in the peak a group of trees that the Aurohuacos call *haichos*. These are supported by water coming down continually from the snow and mountains, and have in their midst a clear spring, sweet and fresh, containing that which creates an appetite in those who travel there and relieves their great necessity from thirst, because, as the distance from the river is great and the road rough, it would be impossible to provide oneself with water if nature had not put there this providence.

Other canzamarias they have, greater and more remote, to which they go each two years for the same feast in the new moon of January, because it is the clearest and most beautiful of the year and is considered by them superior to those of other months; they call it *Zacomero Major*. This feast is for them so precious that those who cannot go from age or infirmity are carried in a hammock, that they may enjoy the benefits they hold so important. The priests cannot turn them nor prevent this custom because the roughness of the sierra, danger of those roads, and inclemency of the snow will not permit that they go to prevent the ceremonies; and though priests in various times, reinforcing their delicate strength with the desire to honor God, have burned some of the cañzamarias, destroyed the ornaments, and preached frequently against these superstitions, using punishment many times, it has all been in vain because the idols have been taken deeper among the mountains where they are repaired, and the Indians then excuse themselves, saying that it is neither rite nor adoration, but a custom of their fathers; and they continue to render in secret the holocaust to the idol, and the people are satisfied and have no fear of the punishment of the true God.

There is in the sierra a cave that the Aurohuacos call Cave of the Holy Ancient (Santo Viejo), from the tradition of their fathers that there the Apostle St Thomas lived when he preached to them, and they look on it with some respect and measure their journeys to pass the night there, at the same time protecting themselves from the frost while they stop to rest on their journey in that place which they reverence. They are so rarely annoyed, and their natures are so serene, that they do not object to show the cave or the canzamaria to any priest who may care to see it, even though the priests may often have done harm to their idols; and thus they appear not to hold the idol against the church, but they themselves know that they can rebuild the canzamaria, in which they have the fault.

These Indians hold it an honorable death to hang themselves, and a sick person will do so on losing hope of health. The method of hanging among the Aurohuacos is peculiar, because it is strangling rather than hanging. The Indian about to kill himself sits on a stone, and presently ties the two ends of a cord, having a noose in the center, one to each foot, and making equal force with his feet, tightens the noose and obtains death in this way, as would be done among us by using the hands. If the sick individual has not the valor to strangle himself, the other Indians consider him without hope of life, and presently, if he remain quiet or is without strength from his sufferings, they bury him half alive, and have the belief that he presently passes after his death to the house of the sun, and for this they do not say, " Now such a one is dead," but, " Now he travels," or, " He now sits beside the sun."

The Aurohuaco who becomes a widower maintains a period of mourning for twenty days without using the poporo, which is for them greater denial than not to eat; and it is a scandal among them if, in the days destined for this fast, the widower uses the poporo even though it is only to take it in the hands, and he who does so they consider a man of little sentiment, and will not give him another woman because he did not care to keep that custom.

They do not live together as man and wife in the night, because they are persuaded that a child conceived in the night will be born blind; nor do they live together at any time, but occupy separate huts with a great stone between them, to which the woman goes to put the food she has prepared for her husband.

The children do not inherit from the dead Indian, but his goods and also his family are all taken to the cacique, who helps them in their necessity, such being the custom by which they live and govern their nation.

The Pintados are subjected to demora like the Aurohuacos, and are settled in the jurisdiction of the town of Tenerife, where they pay their tribute. Their name was given by the Spaniards because from childhood they cut the flesh, introducing in each cut a different pigment, and after the wounds are healed the whole body is painted with a variety of colors. They walk naked except for a small gourd and belt, their painted bodies being their finest dress, especially when matched with brilliant feathers placed in their hair, which is held in place by a turban. They have also feathers on their arrows and other weapons, and in these times those who go to live near their country must have continual watchfulness and caution. The Pintados are distinguished from the other Caribs by their painted bodies; but those who live in the district (near the city) have modified this custom, with the care of the religious teachers, and they are seen dressed as other peaceable Indians. The Pintados are more rational than the other Indians, and with them we will not detain ourselves more.

Those who infest the country about Santa Marta, having their habitations among the mountains above the Rio Frio, from where they make their excursions to the seacoast and to Rio Grande de la Magdalena, are the Indians that by mistake they call Chimilenas, their proper name being Chimiles, which is the same as saying that they are many, because they were so many that they even exceeded the Moscas. They are of great ability in managing a bow and arrow that they use, but they are traitors, and do not come out on being discovered, remaining hidden among the trees from which they attack the roads to kill without risk to themselves, and satisfy their barbarous appetite to destroy travelers. They are so subtle in this and in making their way through the woods that much vigilance is necessary to hear them, and usually they are discovered by the damage they do when there is no opportunity to remedy it. To protect themselves from the plague of mosquitos (small flies) they anoint the body with a gum they call *vija*. Their hair is long and falls over the shoulders and the face, giving them a ferocious appearance, which is increased by their harsh voices and their habit of crying out after they have wrought some damage. There are among them monstrosities of nature, and the Spaniards have succeeded in killing Indians with double sets of teeth. They do not use much salt in their food, which consists of the flesh of wild animals smoked in quarters, broth of boiled corn ground and mixed with yucca, and potatoes and yams. They make rude cultivations, of which many have been burned with their huts in the expeditions that the Spaniards have made in the summers to repulse them. They use the drinks of the other Indians, and have places for uniting in their dances and feasts and to adore an idol which, under the influence of the Devil, they reverence, asking of it divinations and other superstitions. Each man takes as many women as he can maintain, and most esteem themselves by the number of their wives. Their preparations when a child is born are like those among the other Indians, except that the mother bathes with her child in a cold brook with but little ceremony. Finally, they are barbarous in all their customs; nobody can give account of their interior political affairs, because nobody has lived among them.

The Indians that are called Alcoholados are of this same race, and all belong to the Chimile nation; but when the Spaniards in their conquest met those who painted lines under their eyes with vija, they gave them the name Alcoholados, which was perhaps to say that this barbarity made them more horrible in appearance. There is no doubt that these varied marks were designed by their divinations and by the medicine-men to give the Spaniards the belief that their tribes were infinite in number and their conquest was impossible, and for this they were left to continue their diabolical adorations, protected by the impression that their infernal cunning had cultivated. This is according to tradition and has been verified by experience, and for this the Alcoholados, Chimiles, and Pintados are of the same race and in no important way different in their customs or manners.

The Orejones (Big-eared) Indians live on the river Cisar, in the navigation of which they have made frequent damage, and those who travel there have met with many sorry experiences. This name was also given by the Spaniards because they have the lower part of the ears slit in the center to hold ornaments of gold, which pendants were their greatest ornament in the men as well as in the women, and as the ornaments were of poor work and heavy, the slit to support them was made very large. The national name of these Indians was Tomocos, which in Spanish means " Mocos de Oro " because they also break the septum of the nose, introducing there another greater ornament, and some have also a bar of gold in proportion to the thickness of the hole they had made. These Indians still preserve a part of their ancient religion, maintaining in the depths of the woods a camp or great hut which they call the *tupe*, in which they unite to render adoration and ask divinations from a figure that they have hanging from a beam and dressed with leaves and aromatic branches, with turban of bright plumes, and in the hands its bow and arrows. Around the camp there are many pots and jars of drink for the men who go there, and there are benches to rest on for those who come out of the dance, which they form in a circle with the idol in the center; and it is an obligation in that barbarous holocaust that they announce their intentions for the future, and the idol commands what it wishes they should do. This feast was attended by the Indians of the town of Guataca, which is near the Lagunas de Zapatosa; and to correct this superstition that city has been destroyed and the few Indians who lived there were taken to the pueblo of Peñon that the priest might subject them to the doctrine. The Indians of this pueblo of Peñon are of the same race as the Orejones and are accustomed to pierce the ears but not the nose, and it is from them that the little Indian maiden came out of the woods to the church of Tamalameque, asking for baptism, impelled by the virgin of the Candilario of Banco. The Orejones of the forests remain in their barbarous customs of insults and murder. They walk naked, covering the body with vija gum, their hair loose but sometimes held in place with their turbans of plumes. They eat wild meat, and make their plantations to grow corn and roots, and make their drinks in order that they may become drunk at the feasts to their idol. Among them the ceremonies of childbirth are as with the other Indians except that they are conducted with more propriety than among the Chimiles. They do not disdain to eat human flesh when in their assaults they can secure the body of one whom they have killed with their arrows. These arrows are deadly weapons, but not all the wounds are mortal, even though they penetrate some depth, and the reason for this is because the poison (which is the greatest cause for the danger) they do not put on the arrowpoint, fearing that its strength will cause the metal to lose its temper, or they perhaps think that the metal will moderate the strength of the poison, and consequently they put it in the binding; and if the wound, though it may be deep, does not touch the thread by which the tip is fastened to the arrow, there is no danger or risk of death except that of a natural wound; but though the cut has been superficial, or only below the skin, if it touches the binding, the wound is death. The arrows that are tipped with a shark's tooth, or hardwood worked into a point, are the worst because these they make without fear of loss, and saturate them with poison.

In considering an obscure matter one must look only to that which is most certain, and as the Indians of our Province of Santa Marta are not capable of giving the interpretation of their names, one must, in accordance with the law of obscure matter, look for a natural reason, and presume that their names have had their origin in some act, occasion, or custom, and were given them by the Spaniards at their first encounters. There is then no difficulty in interpretating their names, and I will proceed with the material of the previous chapter without clouding the work by writing things on which there can be a doubt.

The Acanayuto Indians were those who by their frequent assaults destroyed the city of Becerril of the Field, but their descendants who today are living on those plains are subject in part to the mission of the Augustine fathers. This name Acanayuto comes from those battle-cries with which the Spaniards insulted the Indians in their combats. One of the most common was to say "*Ha Canalla!*" and as the Indians in general pronounced the *ll* as *y*, they would repeat the words, saying "Acanaya." This is a tradition and is reasonable to believe from the similarity of the word, and if we seek among the customs they will be found *canalle* because these Indians are in a high degree malicious, dishonest, traitors, and hypocrites. With the Spaniards they keep silent, for which it is thought they are innocents; and understanding what they hear, they infer what they wish, and among them the missionaries have suffered the severest pains, not having any security in their hands. For the doctrine they are incapable, desiring to pursue their course in ignorance, and this is the especial cause of their malice. Their houses have roofs of palm, but are without walls or other surroundings. Their dress is to walk naked, with only a handkerchief, which they call *guayuco*, of a single hand square hanging from some threads of fiber of a soft bark from the trumpet tree; and they are of such inferior natures that the women use no other clothing more decent. They make their garden for provisions, corn, yucca, yams, etc., but these plantations serve as hiding places for their traitorous acts, because with the pretext of going there, they consort with the Tomocas of Cisar river, and joining them in the woods take their turbans, bows, and arrows, and join in their rapine and murder; and that which was always done in remote times with the bodies of those that they killed, they still do, and are filled with the defects of the Tomocas. If they are accused of the evil they excuse themselves, saying that they have been detained in the plantations, or were absent hunting wild animals, or other pretext that they invent; and as these cannot be verified and the Tomocas have no thought to give evidence, they continue satisfying their appetite with inward evil concealed by an humble face. These Indians have their governor to whom they render great reverence, executing all that he orders, and as he respects the counsel of the priests, he is able to restrain them; but as not all reaches his notice, not all can be punished.

The Pampanillas Indians are neighbors of the Acanayutos. Their name is derived from small aprons that they use pendent from the belt, both men and women, without any other dress. These Indians are peaceable and so happily disposed that they are almost without manners or customs; but if you direct them to do one thing, they will almost certainly do some other thing. A few of these Indians live at the mission in Becerril, but the most live in the woods like animals, and their habits are such that in spite of their peacefulness they are feared and no person will have faith enough in them to walk with them. They make their plantations to sustain themselves, and hunt wild animals; but they are idlers, little given to work,—which can be said of all the Indians in common, and this is the principal cause of their obstinacy and resistance. They are mostly poor, although the place they inhabit is considered richer than all the others in the province, because it is so fertile and fat and watered with such sweet crystalline waters. With the Acanayutos they have a good understanding. The women of one and the other are alike in the ceremonies of childbirth, and all are similar to the Chimiles because, as all communicate by way of the interior of the mountains, they observe almost the same customs.

The Indians all have the bad use of herbs and subtle poisons, and though they mistrust one another, they confide in herb-men to treat their illness, calling them *curaderos*. These herb-men practise among the peaceables and in the towns, and when the infirmity is not curable with herbs they say that the sickness has come from the Spaniards, from which, it is inferred, they believe they cannot have other than simple ailments, and that when they suffer those that cause virulent humors it is by contagion from the Spaniards.[1] They wish to make us believe that the *curaderos* know from the bite of a snake when it was caused by witchcraft and when it was accidental, because they also cure this poison and without difficulty. He who cures must have a compact with the evil one, because there are Indians who take a snake in the hands to hug it, raise it to the mouth, and wrap it around the body with all safety, although they make the flesh tremble of those who see them; and this they say is not by compact, but because they have been treated by a *corador*, that is, cured by burns that have been made in various parts of the body, introducing in them various antidotes reduced to powder and giving to drink drafts of extracts of herbs. In this preparation they employ a certain number of days and then expose the cured to the public show of the snakes, because they believe he is now free from their poison; further, they take this cure more for amusement than for practice or good effect.

The name Tupe is the same as Cerrado (Reserved), and for this similarity one word has been used in place of the other because the Tupe Indians are in the highest degree reserved and barbarous, more than any others of the province. The Tupes in the jurisdiction of the Valle are subject to doctrine and demora; they are not now such idiots in their customs as the others, although they always are in their explanations of them. The wild Tupes of the forest are similar to the other Caribs, and of them little can be written ; nor will the peaceable ones give any explanations, but all in general have a prepared answer, which is this: "That is suitable," with which they put off any question they do not care to answer, and nothing more can be had from them, even though asked many times and with varied sentences.

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[1] In tropical America the Indians generally claim that syphilis was introduced among them by the Spaniards.

Those Caribs who inhabit the mountains of Ocaña are called Motilones (Cut-haired). These were conquered in the beginning and established in the plains called La Cruz, where they were subject to doctrine. There occurred after a time a general epidemic of smallpox in Ocaña, and the Indians went in fear to their priest, who made them take baths and cooling drinks to moderate the natural heat of their bodies and make the smallpox less virulent among them, and finally he had them cut their hair that their heads might be cooler. This, with the destruction of infected material, would have been sufficient, but one night they made common cause together, and by force carried to the woods the priest with his vestments and other ornaments, leaving the town deserted. Six months they were fugitives, sending spies from time to time to learn the state of the epidemic, and after a while, when they were satisfied it had passed, they returned to La Cruz, bringing the priest. The neighbors, and presently the other Indians who had seen the spies with their hair cut, began to call them Motilones (Cut-haired). The priest, who had not taken his enforced retirement with much pleasure, had after that but little confidence in the continued obedience of these Indians, and went among them only when it was necessary, and for this reason, when another epidemic appeared a few years later and the Indians went to the mountains, they never returned. From these Indians the race of Motilones descends, and from what is written is found the etymology of their name, which is a tradition reasonable to believe, because they cut their hair, and the circumstances narrated account for the motive that established this custom among their ancestors. Their manner of living is not well known, but it is certain that they have communication from their mountains with the other Indians, and it is also certain that they have departed but little from the mode of life of the other tribes. It has been unhappily experienced that they put to death as many of the whites as they can, and that in this they are quite as effective as other Indians.

The Indians of the Guagiro[1] nation are those who live on the seacoast from Rio de la Hacha to the Sucuy. Of these a better account can be given, because although they are not subjects, they have a voluntary communication with the Spaniards, especially to trade in pearls. In that coast is the road to "Maricabo," traveled with some risk even with the protection of armed men, because not all the nation is alike. It is supposed that it can be said that the name Guagiro is the same as to say "Valiente con ligereza," not only for the similarity of the word, but for the great conformity that they have to this, for there are not any other Indians in all the province who have the valor and agility of these. In their fights they present themselves body to body, and if it is civil war among them, they go out in troops to fight together, and presently, on presenting themselves to their enemy, they form in semicircles, each body trying to catch the other in its center to destroy it; and, without ceasing one and the other to shoot their arrows with great rapidity, give jumps and quick movements that the enemy may not secure good aim. To save oneself from this semicircle, and to break it if the opposing body is Spanish, it is necessary to have great caution in movement and continuous action, because with a pause in firing they come with their hands at the enemy, for they know that the firearms must be reloaded, of which in the beginning they were ignorant, believing that it naturally discharged itself without the aid of fire and ball; for which it is necessary to use during war with them all military tactics. Their manner of declaring war according to their barbarous custom is, on being aggrieved, to send their ambassador, whom they call *palabra* (" talk "), asking from the person of whom they are aggrieved that right, reason, or restitution which they require, and, denied, they declare war. The enemy who receives this palabra has brought together a company of Indians, with their horses, ready to aid him in preparing for this war. These hear the talk, which is publicly given, and without waiting other orders they go each to secure that party of men to whom he has been commissioned There then is a short truce that they respect, and while waiting for the commencement of hostilities the horsemen can in one day unite twelve thousand or more fighting men.

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[1] This is the old spelling; today the common form is Goajira.

If it be a fight between persons, and the Guagiro goes out mounted, on seeing his enemy he dismounts and with the first arrow he shoots his own horse, that it can be seen that he does not have the advantage and to deny himself the possibility of fleeing; he then puts himself in front of his enemy to kill him or die at his hands, and this because they are so barbarously vain of their valor. Their manner of fighting is to go always at the enemy from the left side, twisting over the arrow and letting it go when they think the shot is sure, meanwhile passing with quick movements, jumps and turns, with the legs open and the knees bent, that it might be difficult to hit them with an arrow or a ball.

They are all generally so expert and secure in their shots with arrows that there are no others more dexterous; and in their practice they throw in the air an orange, lemon, or similar fruit, and at the same time put the arrow in the bow. It is a thing of small value among them if the fruit falls without being hit, and he who fails to do so is laughed at by his companions. In all their fights

— and they count among themselves many civil enemies — they make common cause in their hatred of the Spaniards, whom they call Arijuna. Among the many unhappy deaths given at their hands is that some years ago of a Spaniard called Tomas Quintero, whom they killed without other reason than that he had entered their territory on an occasion when they had withdrawn voluntarily from communication with Rio de la Hacha, though it was not known that they had retired. But these Indians want little incentive to kill a person, and they killed him thus most unhappily and without cause; for which traitorous act all the vicinity of Rio de la Hacha went out to make war, and it was so vigorous and bloody that the Guagiros confessed themselves beaten, asking for peace, offering not to make such acts again with the subjects of the King of Spain. To atone for the blood of Tomas, they gave to his Majesty an eagle and two heads of gold of low grade, which is the pledge they gave to maintain peace, and at present deposited in the Royal Treasury. But as they are so flexible in their words and promises there is no security from their attacks, and they maintain this peace to mean only that they shall not invade the city.

Nobody can trust a combat with a Guagiro Indian whom he has offended, even when not alone, because at a common cry there come so many that it is a horror to see them, and they should be called Chinches from their likeness to the chinch-bugs that can hide in the smallest places.

There is no cacique among them either by inheritance or election, and their chief is he who is the richest. At present it is an Indian called Capaurinche, or Toribio. He lives in the province of Hipapa, between Bahia Honda and Chichibacoa; but as their riches are not stable, and with the civil wars that one clan makes with another, and with robbery of the haciendas, the honor passes frequently from one Indian to another. He is called rich who has his hacienda in cattle that were obtained by the frequent attacks which in past times were made against the people of Rio de la

Hacha, and money does not constitute riches among the Guagiros because they do not need it. They have the best horses on the coast, and esteem most highly those of varied colors because they hold them stronger and more able; and if one is marked with five colors, the owner says, "My horse has five coats and is five horses,"—and they esteem a horse to be equal to the number of horses according to the colors of its coat. It is difficult to persuade them to sell it; but horses can be secured if the Indian is shown some beads such as corals, garnets, colored glass, or others that the purchaser may have, and this is cheaper than money, because for that they have no need and consequently are only satisfied with much of it, and it is necessary to have great astuteness in trading with them.

They have also the vice of the jaya and use the poporo as the Aurohuacos. By carrying a little jaya it is enough to admit one to travel among them freely, and with but little expense. If a troop of two hundred or more Indians is encountered, they can be told to stop and then given of the jaya. It is polite among them that the same thing and the same portion that are given to one must be given to each of them, and so by giving a little jaya to each one of them, they are content, being satisfied with what can be taken with the thumb and two fingers, that being the portion that they are accustomed to put in the mouth to receive the lime which the stick takes from the poporo. If the traveler says he has nothing else to give them because it comes from a boat that was wrecked, they let him go more promptly, because the Indians call all the people and things they have not seen, "ship-wreck," and, hearing this, believe the traveler is not a citizen of Rio de la Hacha. They have determined that there should not pass their lands any men except those who have been wrecked on these coasts and who came with such poor fortune, and it is among them a thing poorly esteemed to molest anyone who has come among them in such trouble; from which we must infer that to say to the Guagiros "ship-wreck" is to say "a lost man."

There are among them the diviners called *mohanes*, who are understood to be the same as the *santones* of the Moors, with whom they consult for the future. As it is so many years that they have been expecting the conquest, they ask of the mohane, and he, to answer, after performing his ceremonies, sits with a lighted cigar in his mouth, and if by accident he has his back to the wind and the smoke goes from his face, as is natural, he says that it is not time for it to come; and if on the contrary the smoke comes into his face because that part is against the wind, he says that the conquest is coming, and thus with one or the other chance they are expecting it, now farther away, now nearer; but to the Spaniards they say, "When will this, your conquest, come? My father, talking with me, said the foreigner will bring this conquest; my grandfather also; now both are dead and the conquest, she has not come"—and from this they infer that all is a lie. They believe that the conquest is nothing but a woman of ferocious aspect, and they laugh at it, saying, "Conquest, what will it do with Guagiro? Guagiro plenty, plenty and brave and the conquest she only a woman."

The Guagiros are very vindictive and their hatred has no limit. In the day when one recalls to mind a person who has killed or badly treated a relative, although not very near and there had passed much time since the act was committed, he proposes to "cover the blood," and the method is to arm himself with both bow and arrow and seek the aggressor. Finding him recalls the dead, and he says, "You killed my relative and blood you have not paid to me. I have come to cover the blood." The other must now fight or pay this demand, but their custom is to pay, and usually they adjust it in so many heads of animals, horses, mules, or chickens. If the aggressor has not enough for the payment, he must ask alms among his family, who must give him as each one can, and when the animals have been collected they are given to the demander, who has not moved from there nor slept nor disarmed until he is satisfied, and putting his animals ahead of him he leaves his creditor free, but not from the other relatives of the dead person, because each one will do the same at some time when the aggression is recalled to mind.

They who ordinarily cause this strife are the women who, having more feeling and less risk, make frequent memories, and they begin to cry with sad lamentations whether it be a relative of theirs or of their husbands, even though they had never seen him, because the feeling is to secure gain, and whether they really feel the loss or not it makes little difference. The husband asks why they cry, and they then call to his remembrance the damage, persuading him in their barbarous language to seek revenge. Because the crying and persuasions of the women are great, they make the Guagiros more bloody in their quarrels, persuading them that when they submit it is a disgrace, and that they must demand satisfaction in a great many animals. They call an animal ten pieces whether it is of cows, horses, mules, pigs, or birds, and thus the animals really asked for are few, though the number of pieces they demand may be many. It is necessary to have great judgment, particularly if the person against whom demand is made is a Spaniard. But there are among us men so sagacious that with the same custom of the Indians they make gain even though they satisfy the number of animals that are asked: for in a short time they seek their demander, and fixing on him a damage or murder caused by a relative of that Indian (who because he had received atonement for blood must now give in atonement without fighting), and asking of him double, the Spaniard has the advantage because the Guagiro, although he has not with which to pay, must ask alms among his people, and this they must quickly give because they hold this justice with great care although with bad methods.

Their ordinary dress is a mantle of cotton goods dyed a dark color, with a hole in the center for the head. The mantle, hanging pendent over the left shoulder, falls to the knees; it is secured by a belt, leaving the right arm free to handle the arrows.

The dress for the women is similar, and to distinguish them among themselves their only sign is an anklet of beads on each ankle. The poor women use glass beads, and those who are rich, corals or fine garnets. Some use necklaces about the neck, and if the woman or man is important among them the mantle is white with various adornments of color. They esteem the Spaniard who is dressed with care and take him for a great man, saying that the King of the Spaniards has arrived; and if the dress is red, it is of much greater importance; but a rough, ill-bred person cannot influence them with fine clothes.

These Indians do not have home, nor hut, nor any fixed habitation, living only beneath the trees, and moving from place to place according to the seasons and the search for the wild fruits of all that coast; because it is with these and wild roots that they maintain themselves. Wherever they go they carry with them their cattle, horses, mules, chickens, dogs, and all that they have. They do not eat much beef, being reluctant to kill their animals, and this is the reason so many come to the Rio de la Hacha in time of feasts when they wait to share in the animals that are killed during those days. That which they commonly eat is fish, mollusks, lobsters, crabs, and tortoises, which they secure in the waters of that coast. Of animals they hunt deer, armadillos, land tortoises, and other various kinds, but they are not of common use. Yucca serves them for bread, and for vegetables various wild fruits and roots which they know and like.

The principal Indians sleep in net hammocks which they hang below the trees, and the others, and also the women, sleep in the sand without either bed or cover, except the mantle, or even naked. Each Indian takes the women he can maintain, for in this they distinguish the richest. They live together without any ceremony, for it is their custom and Heaven cannot move them to break it. They all sleep but little, for at nights is their heaviest eating. They never quit the hand from the poporo, and because of this vice they have their teeth black, and as their skins are of very dark color, the body painted, and the limbs well placed, they are ferocious in aspect. The truth is not found among these Indians, particularly when they speak with Spaniards, with whom they delight to chat; and, unhappily, any damage they can do, even to afflict a Spaniard with death, is a merit among them. They are so averse to the Spaniards that nothing can be done with them, and even the children who have been taken and trained with care depart from this teaching and become three or four times more beastly than the others. If an Indian sees a Spaniard pass, he observes closely the road taken, and when the traveler is lost to sight, mounts his fastest horse and goes to his ranch to give notice, saying, "Spaniard now has passed. I come after." He tells the road taken, and there go various men to give notice in the neighboring ranches, and when the poor traveler thinks himself most secure, he finds the road stopped with fifty or more Guagiros asking him of what he carries, and if he has not enough to content them, they attack him, and in this way have killed many.

Among these barbarians can be seen various interesting games. Among them the game of ball is much used, because with it they advance the exercise of the arrow, thus giving them strength for battle. They form the ball from the skin of a goat, filled with cotton well pressed. One throws it in the air, and below it there gather, with many jumps and movements, ten, twelve, twenty or more Guagiros, each with his bow and his belt well provided with arrows, which they call *cipotes* because they have the points in the form of a top. One shoots his arrow before the ball falls, which then returns upward in proportion to the force, and the Indian changes his place in the group of men to put another arrow in his bow, and as it descends another shoots his arrow, sending it high again, and with regular movement passes to put another arrow from his belt, and this is done successively by the others, forming at the same time a pleasing dance, and with their shots maintaining the ball in the air two or three hours, which exercise, while it amuses them, gives them ability for their combats. He who is not able to take part in the circle is but little esteemed, and must practise alone or with boys and younger men until he is capable of appearing in the public act.

The Guagiro Indians have a peculiar fast, to which they submit the young Indian maidens, for which no reason can be given except that it is an irrational custom. Some prudent men studying this custom find among these Indians a resemblance to the Hebrews, who, as they believed, shut in the young maidens at certain times in expectation of the coming of the Messiah. The custom of the Guagiros is this. Near the time in which the Indian maiden is to become a woman, her father forms a small hut of grass, which they call the "yard of earth," and in this they shut her, and it is said that they do not allow sun, moon, water, air, nor dew to touch her, and they say she is in *cuyma*. Here they keep her fifteen days without giving her other provision than water and fire, which is truly a terrible fast, and it results that she comes out of the hut after fifteen suns, as they sometimes call this fast, white and transparent as a fine sheet of paper. With food they regain flesh, and with the heat of the sun and other inclemencies of those coasts, return to an ordinary color. If, during the imprisonment, anyone asks for her, they answer that she is in *cuyma*, with which they know all the circumstances, and believing that she will shortly be married, they begin to feast.

Among the Indians it is not the child of the father who inherits; the property goes to the maternal nephews, the Indian saying, "They are more nearly of my blood." The sons of the sisters not only inherit the property of their uncle, but also his wives, and if the nephews cannot maintain them all and their own, they repudiate from among them all as many as they wish, retaining only the number of women they can maintain; and those who have been repudiated are no longer known as wives, and this is according to the law. If the Guagiro, from choice or by force of predestination, dies in our Catholic faith in any of the cities of doctrine, and leaves, as is just, his goods to be administered by the priest (who if he can find his maternal children gives them the property), then the nephews who expect to inherit make demand to the principal chief, who makes inquiry among the Indians of the circumstances of the death, and finding that it was according to our Catholic rites, decides that the Indian died as a white man and his children have a right to enjoy his inheritance. After this the nephews make no further claim, but if they find the Indian died in his idolatry, they give his goods to his nephews, leaving the children disinherited and poor.

The ceremonies for the burial of those who die in their idolatry they make according to the castes [clans] by which they are distinguished. Thus: Casta de Guacamaya [macaw] (this is the highest), Casta de Paguil (turkey), Casta de Guacharaca (a kind of brush hen), Casta de Mono (monkey), Casta de Machin (small monkey), Casta de Gallinazo [turkey-buzzard] (this is the poorest). The ceremonies consist of crying, dancing, and eating more or less in proportion to the caste, and if he who is in affliction is poor and asks alms for the remembrance of the dead, all give it. If a Spaniard gives to a Guagiro — which he does at times — strings of beads, a blanket, a skein of worsted, or a knife to please him that he may dive for pearls in order to make return for the gift, and the Indian says, "Relative, my heart is happy," it is a sign that he is pleased with the gift and the giver can expect the recompense; but if he says nothing, he is not pleased, and the goods might as well have been thrown away.

These Indians have various customs which for obscenity cannot be written. Their ceremonies of child-birth are the same as those among the other Indians, including also the cold baths in the river. The men of the smaller cities are under control, but they still retain their own customs, and though the priests have worked earnestly they can do nothing to make them contented with one wife, and even in places subject to doctrine one is accustomed to hear them say, "My head is hard as a tree; it is better to teach the children who have soft heads," and against this the priests place many penalties, but the transgressors always say, "Capuchino [Priest] as Guagiro, no; Guagiro better with hair on his head and the Capuchino with hair on the face." They have a sergeant major and a captain of all their nation, nominated by the Governor of Santa Marta from among the most rational of the descendants of the Indian Salguero, to whom they render fear and respect; but as all are as treacherous as they are dangerous, they give little obedience and are continually at civil war one with the other.

There is in that coast, on the part nearest Sucuy, a mountain which, because it is formed like a bent person, they call the Corcovado, and the Guagiros who are born there take the same name and are called Corcovados, for they are so like the nature of the country that nearly all are hunch-backed; and those Spaniards who go to that territory to obtain pearls, or go to "Maricabo," assure us that not only the Indians but also their animals and even the birds are generally hunch-backed,—of which it must be inferred that this is caused by the star influencing that place, and that country seems of an evil influence, for it is true that these Indians are averse to our Catholic doctrine, though they are known to have heard the voice of the Evangelist.

Near them are the Indians called Cocinas, which name is the same as to say Tiznasdos, because to preserve themselves from the mosquitos they use an ointment taken from the fruit of a plant called *jagua* which gives the body a black color which, when they perspire, becomes shining and lustrous. These Indians are more barbarous than any of the Guagiros, and consequently less tractable and more dangerous, horrible, and proud. Their customs nobody has studied, but as they are almost as the Guagiros and are considered to be of the same race, their customs are supposed to be similar. These Indians were visited by the venerable Father Luis Vero and by his holy companion San Luis Beltran, whom they understood, for he had the holy gift of tongues and he communicated to them the divine Providence. Among all the Indians many have preached and labored, but of little avail; and of truth if the Indians could all be subjected to the Church, great good would come to the Province of Santa Marta and to Rio de la Hacha.

RECENT OBSERVATIONS

The Indian tribes of which Father de la Rosa wrote more than 160 years ago have now almost entirely disappeared. The Goajiras are still a vigorous race, and the fierce Motilones are said to be increasing rapidly in the wild fastnesses of their country of the Painted Andes, but of the other tribes there is scarce a memory. Broken pottery and stone implements cover the ground where their villages stood; frequently in passing through the woodlands low mounds of earth indicate the sites of populous cities, and widely separated one from another live a few miserable, scattered remnants of a once numerous people.

Of these little can be said, but those who remain indicate a low type of man. They have thick lips, irregular, flat faces, short heads, and poor physical development, their identity having almost entirely been lost through long service to the conquerors. Of the Chimiles or Chimelones there are a few remaining in the woodlands southwest of Santa Marta. Once they were dangerous and much dreaded; now they are anybody's friend, but have little to commend them. Extremely ignorant, degenerate, and dirty, they live in miserable huts and run through the woodlands almost nude, using a gourd fastened around the waist in place of the robe or loin-cloth of the more sturdy Indians.

There are so few of the Chimiles that they are worthy of only passing notice; and of the other tribes mentioned by Father de la Rosa as belonging to the lowlands and brought under the direct influence of the Spaniards, all have disappeared. Here and there a few people of mixed Indian, Spanish, and negro blood are found, but that is all. They have no traditions or tribal life among themselves and of them there is little to be written. The

Goajiras are still a vigorous race, and though they occupy the lowlands, their country is an isolated peninsula and they have been left very much to themselves.

In the elevated fastnesses of the Sierra Nevada de Santa Marta live the remnants of a once powerful tribe. Their country overlooks all the great territory formerly occupied by the Indians of the lowlands. These mountain Indians are known as the Aurohuacas[1] and are such a peculiar people, differing so completely from all others that I have seen near the Caribbean sea, that they must be the remnants of a very ancient and much more highly developed people, who at some remote time were driven to take refuge among the higher mountains because of incroachments and violence of more savage neighbors.

In all their life and customs an ancient descent seems indicated. Nominally they are all humbly obedient to the teachings of Franciscan missionaries who have preached among them for many years; but in spite of the little chapel built in their principal city of San Miguel, they still cling to their ancient customs and beliefs, but have no objection to a variety of teachings and assent quite readily to all that the priest tells them. Their chiefs are called *mamas* and are apparently not elected or appointed by any ceremony, but whoever, after listening to legends and watching ceremonies, can imitate what he has seen and remember what he has heard, may aspire to be a *mama*, his efforts being more or less successful according to his skill in impressing his hearers, or his good fortune in healing the sick and predicting the future. The Aurohuacas divide the *mamas* in two classes, "proved mamas" (*mama probow*[2]) and "mamas."[3] A small boy, living near their country, who had been among them and could imitate anything, because of very sharp memory, was beginning to be held in some reverence and was known as *Mama Pelu*, hence by this time he may have acquired great influence among the Indians.

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[1] Commonly spelled Erguaca and pronounced *Erwaca*.

[2] Indian patois for *probado*.

[3] That is, *mamas* without established reputation.

By this method naturally the best men come to the front — those having a retentive memory, a commanding presence, ambition to rule, and an insight into character to assist their predictions and divinations.

In appearance the Aurohuacas are rather impressive. Their dress, a long robe of coarsely woven cotton, falls to the knees, leaving the throat, arms, and feet bare; a belt of knotted sisal holds the garment in place, and a band of the same material about the head keeps some order among their great masses of heavy black hair which falls otherwise unrestrained about the neck and shoulders. The country they inhabit is cold—so cold that in the higher mountains there is perpetual snow and all the streams are icy in temperature;—yet in spite of this the children have but little clothing and must go every day at sunrise to bathe in the clear mountain streams. But they are not a vigorous people; few children are born to them, and before many years probably all will have disappeared. Throughout the mountains there are remains of a once numerous people; now it is probable that in all their territory there are fewer than one thousand full-blood Indians. The broad mountain valleys of their country are so desirable and fertile that before many years a stronger race must undoubtedly dispossess them.

Of strange marriage customs those of the Aurohuacas certainly deserve prominence. The man who determines to take a wife must first build his house, or more correctly his houses, for he will require two of them—low, circular structures with tall, sharp-pointed, thatched roofs—one somewhat larger for himself and the other just behind it for his wife. After the *mama* has declared them married they go home by different roads, the woman to her house and the man to his, and from that day never by any circumstance will they go into each other's houses, nor do they so much as speak together while at home. When the wife prepares food for her husband, she places it on a stone between the two houses, where she leaves it; then the man comes and takes the food to his house. Having eaten, he returns to the stone the empty gourds in which the food was served, and goes away; then the wife comes and takes them again. They have only one place that is common ground to them, and that is their garden, where in some secluded spot they cultivate the soil together. At all other times they are strictly separated, and the reason for it all is, as stated by Father de la Rosa, their belief that a child conceived without the light of the sun will be born blind and have no light in its eyes.

From this it may be inferred that they worship the sun, or at least hold it in high veneration, that in their domestic politics the garden, its industry and products, must be the basis of their life, and that the restraints of their separate houses indicate that the married relation has for them responsibility as well as convenience, placing these Indians, degenerate though they are, far above any of the other tribes inhabiting the Caribbean region.

Of strange beliefs, ceremonies, and traditions, their thoughts and customs are overflowing; ask where they learned all these things, they will say their fathers told them and charged them to tell their children that nothing might be lost.

To write of all would require a volume, but of the more important and interesting something can be said. As the basis of their government is their veneration of the *mamas*, these men can properly be noticed first. Each *mama* is at once priest, governor, and doctor for the people of his village. He leads the religious ceremonies and dances, advises in disputes, makes divinations for the future; but principally his duty is to heal the sick, and if successful in this, he becomes a *mama probow* (*probado*, "proved") and is held in great veneration. The methods practised by the *mamas* are quite in accord with the claims of Christian Scientists, and the heathen *mama* is quite as successful as the enthusiast who claims divine intervention. The Aurohuacas object to taking medicine, and believe that all sickness is a punishment for sin. When a man sends for the *mama* he expects to make a full confession. On entering the sick-room the *mama* goes through a series of motions as he passes in front of the sick person; then coming closer he moves his hands mysteriously over the face, arms, and feet of his patient, and taking him by the wrist, asks in a deep voice if he wishes to confess his sins. Usually the patient replies that he does, but if not, the *mama* simply goes away. When the confession is heard, all others are put out of the hut while the *mama* and his patient confer. After hearing all the confession, the *mama* decides whether the sins are mortal or whether they can be forgiven and the patient recover his health. This requires some judgment; the *mama* must decide from the condition of the patient, because he can become equally famous by telling a patient that he must die for his sins (which on being so informed he usually does without much further delay), as he can by predicting renewed health and prescribing the formula for recovery. This formula varies according to the sins confessed; the belief is that stones or sea-shells have the power of working a charm to propitiate the evil influence, and the lore of their stone-medicine is endless. Often some peculiar pebble, strange sea-shell, or curious stone will bring almost any price when these Indians happen to need that special kind. The *mama* having found that the patient can recover, gives careful instructions as to the bits of stone, pebble, or shells that must be obtained by the sick person's relations to effect his cure. This is done by setting up a charm on which his sins can rest. When it is procured, the material must be taken to some spot among the mountains—usually high on the upper ridges where the sun falls as it first rises. Here a rough piece of stone is set up, and the few fragments that have been obtained with such effort are laid before it. The party then returns, and if the patient recovers, great is the fame of the *mama;* if he dies, the Indians say the *mama* is no good, but he is still a *mama.* The charm on which the sin may rest, set up where the rising sun can first reach it, brings the veneration of the sun into prominence; and if awe is akin to worship, the inspiring sights of golden tropical sunlight flooding deep valleys, the towering rocks, the long shadows among the mountains, the glittering light of the sunshine on the mantle of perpetual snow, the silence of the night time, or the weird distant uncertainties as a dense fog floats among the mountains in deep contrast to the wealth of sunlight, may well inspire awe, and is perhaps the reason for this form of the Indian's worship.

During the rainy season, when the sun is hidden behind great masses of dark clouds, the Indians set up a wailing for their sins, believing that the sun is angry and may never shine on them again.

It is rumored that these Indians have an ancient massive stone temple hidden in the deep valleys of the interior mountains. They will not answer any questions, but the rumor is generally believed, and it is said that long ago there were Indians who would tell of its glories. It is supposed to be square, or oblong, of massive, roofless stone walls, that inclose a great carved stone altar of dark granite on which, or on the wall back of which, there is a great model of the sun in pure gold with a golden image of a bird of great size standing before the altar to attend on the sun. Here it is said they go every year or two for the purpose of hold ing strange ceremonies, but where the place is no one knows. This much, however, is certain: when the proper season comes, most of the Indians disappear, and after a time return as mysteriously as they went.

Among other strange beliefs they have a fixed faith in a prophet whom they call the Tach. They say that he came to them out of the sea and that he will return to make them a great people. In the latter part of December or early in January, according to the time of the new moon, they all assemble and dance in expectation of the coming of the Tach. They perform strange motions with masks on their faces, and robes, stone ornaments, and bright-colored objects hanging about them. The men dance by themselves in what they call the *canzamaria*, or native temple, but the women dance apart by themselves beyond the temple. These temples, of which there are a number among the mountains, are little more than the ordinary circular huts used by the Indians for houses, but are made larger, with a really high roof, from the peak of which three poles protrude like an inverted tripod, on each of which is placed a large clay cylinder or bottomless jar. Inside the *canzamaria* there is nothing, the material for the various ceremonies being brought by those who are to participate in the dance or worship. These dances are performed by making motions with the body, taking quick steps from side to side or forward and backward, accompanied by subdued cries and a sort of refrain that is droned as the dancers proceed. The dances are named after different birds, animals, or people, which are supposed to be imitated in the performance. The white men are honored with a dance supposed to represent people who have become quite crazy.

Of their prophet they will say very little, but an Indian told the story to me, though it required urging from a Colombian who had heard it and wished that I should hear the story from the Indians themselves. His account, in brief, was as follows:

Long ago, longer than the lives of the oldest *mamas* and in the days of their fathers (fathers of the *mamas*), whose names had been forgotten, a stranger came up out of the sea. His skin was white, but he was not pleasant to look upon because his hair had grown wrong and covered his face, and not his head where it should have been; and the people thought to kill him, but the *mamas* to whom he first had come, and who were wise, gave hospitality and kept him alive. His dark garment was girt about the waist and flowed below his knees. When the people saw that no harm came, they were no more afraid, and saw that he had clear, kind eyes. They helped him and he lived among them; but he wanted little, and when the time came that they could hear his voice—that is, when he could speak their language,—he taught them all things that were good, and the fathers who lived so long ago that their names are forgotten told their sons, who told it again that the story might be remembered.

This man was the Tach, and his teachings are these: That to worship the sun is right, that it is holy and quickens all life; that gold represents the sun on the earth and it is holy, and those who gather it must hide it and let no stranger look on it, in order that there should be much gold when he returned; and when he came again he promised to make them a great people. And he prophesied, saying that others with hair grown wrong and covering their faces would come, but they would be different and none could trust them, and he who bargained with them would carry away not enough and would give too much. To these strangers no gold should be shown, nor should they see the temple and holy gold (perhaps the golden images of the sun and the bird), because on the day in which they saw them they would carry all away and the sun would be angry and never shine on the mountains again.

And the Tach said, "Live at peace and shed no man's blood, but cultivate the soil, have gardens, and eat plenty." And he charged them to live only with their own people and take no strangers—not Indians nor white men with hair on their faces—into the tribe, but remain a people apart, yet hospitable. And if strangers came, to receive them with hospitality, for he came as a stranger and would so return, but that no stranger must stay too long in the land, for that would not be good. Then he taught them all the lore of sins, sickness, and death, and the healing charms of stones on which the sin could rest, and he went away to the sea but will return out of it again.

This is probably their conception of the teachings of a missionary priest who chanced among them and who, seeing gold, thought of the necessities of the church and what a great people the church could make of the Indians if it only had the money; but when they heard of a second coming, the Indians naturally thought that the priest spoke only of himself.

A very practical result of this legend is that the Aurohuaca Indians have been collecting and hoarding gold for perhaps three centuries and are supposed to have tons of it hidden among the mountains. An old Spaniard living near their country claims to have seen part of the treasure when he was a boy, at a time when the Indians were moving a hoard of gold to a more secure place. He told me that there was as much as several oxen could carry, and that it was welded into rings and bars.

The Aurohuacas claim that if they show gold, or any of the places where it is found, to white men, they will die—all of which is quite true, for there is no doubt that the *mamas* will kill them.

Strangers are hospitably received, but they must not stay too long, for the legend of the Tach says that no good can come of it. If the visit is prolonged, the Indians will begin to say, "He will go soon; he will not stay much longer; now another road awaits him, he must travel"—and if the stranger does not take the hint, he will presently be poisoned, and the Indians will say, "Now he travels another road," but they will do no violence, for the legend of the Tach forbids it.

The ordinary life of the Aurohuaca is devoted to tending his garden, herding his cattle, assisting in dances, and listening to legends of other days. Their territory could probably support hundreds of thousands, yet they themselves are dying out, very probably because of the constant use of the *poporo*, as described by Father de la Rosa. The leaf is from a species of coca, similar to that from which cocaine is manufactured. Toasted and mixed with quick-lime these leaves must be a very violent compound, and its constant use is the only apparent reason why a people living in a healthful, temperate country, where everything is beautiful, should be degenerating and passing utterly away. They live in villages, and are among themselves sociable, talkative, and apparently very happy; with strangers they are reserved, and few gain their confidence.

That they were once a powerful people is attested by the remains found all through their country, but now so few of their number are left that great stretches of their mountains are entirely uninhabited, and probably in two or three generations none will have survived.

Across the broad interior valley, beyond the Sierra Nevada of Santa Marta, lies the northeastern spur of the Andes, known as the Painted mountains, because of the alternate black and white strata, like great hands, which extend at places along their precipitous fronts. Here a tribe known as Motilones have their homes, but about them little is known, except that they resemble the Indians of the lowlands, and that they are savage and dangerous. No one has seen much of their villages, for with strangers they will have nothing to do, and to meet with them is to kill or be killed. Unfortunately, they are aggressive, and the traveler near the Painted Andes can never be sure that the next turn of the road may not bring a shower of poisoned arrows from Motilon Indians, hiding in the long grass or among the bushes that cover the plains below their mountains. How many there are of this tribe is not known, but it is supposed that they are numerous, and that in time they will overrun all the exposed portions of that country. Recently, as I was passing near this territory, Colombian planters told me that the Motilones were becoming more and more aggressive and numerous, and that unless something was done to check their encroachment, all the coffee plantations of the Painted Andes would have to be abandoned. Little is known about these Indians, and I have no direct information concerning them save what is gathered from the *Floresta*.

Northeast of the Andean terminus is a broad, level peninsula, inhabited by the Goajira Indians and named after them. These people are in full vigor, and form an interesting comparison with the other degenerate tribes of the Caribbean regions. Strength, fine health, and the free carriage of confidence at once stamp these people as different from the cringing Indians of other tribes. The Goajiras are dangerous, but they will fight, not poison, and will give notice to the enemy to prepare for defense. They are hospitable in the extreme, and once received as a guest, the traveler is safe. Of medium stature, of deep mahogany or perhaps copper color, wearing an effective dress of white cotton, embroidered with red worsted along the edges, the left arm bare and the whole costume falling in easy folds about the body, a tall red feather in the hair, held in place by a plaited band of fiber, they present a striking picture, which is intensified by the glow of health that is one of their general characteristics. The costume mentioned is worn when they are dressed for effect; at other times they wear a mantle or smaller robe of dark cotton stuff, usually very dirty, and frequently they wear nothing but a loincloth. They live much in the open, sleeping with no covering, exposed to the heavy tropical dews, and making no complaint when the burning sun beats on their almost naked bodies. Once I was in a canoe with some young Goajira Indians and suffering intensely from the heat of the sun; but the Indians paddled along without complaint and I, wondering at their endurance, laid my hand on one of their naked backs and found it cool and pleasant, although the wood of the canoe was burning hot.

These Indians bear resemblance to those of North America, and there is rumor of a legend among them that they once came from the north and conquered their country. Among them a peculiar type is seen which all claim is of full Goajira blood, yet there is no resemblance, even to the Indian type. The face is large, the chin full and rounded; while the cheek bones, which in most of the Indians are very prominent, are symmetrical. The head is full, the hair curly, and the nose large and well formed; the type is almost Roman; indeed, in their flowing robes, these grave, commanding Indians remind one of fancied Roman senators, rather than wild men of the tropics. Others of the Goajira nation are small and distinctively Indian in all their features: these are usually people of the lower classes, for caste distinctions are rigidly maintained, and those who command are usually larger and much finer people. This distinction of types in the tribe, together with the pride in descent or caste, may be the heritage of a remote conquest centuries ago, after which the weaker settled down to serve the strange invaders.

Their government is strictly patriarchal and the different families or clans are frequently at war with each other. So bitter is their hatred, once it is aroused, that their feuds extend to extermination, and life is but little valued in their country.

As a rule they are not friendly to strangers, and it is always dangerous to go among them. A person with light eyes is particularly obnoxious in their opinion. They say, " Eyes like a cat; come, let us kill him ! "

Their laws are respect for established custom, rather than rules for procedure. Their respect for inherited position seems very strange for wild men; acquired wealth, which brings power, is of prime importance, but he who inherits wealth takes a position and wields power that a successful, industrious Indian can never attain, no matter how wealthy.

Polygamy is practised, but the customs establishing it are of some wisdom and where adhered to are productive of good results. The basis of these customs is that a man may have as many wives as he can maintain, and the more he has the greater his importance, but to secure them he must first provide an endowment.

The Indian girls are sold to their husbands, but their parents have nothing to say in the matter, the maternal uncles having full authority which the girl must recognize. The marriage ceremony consists of a series of fastings and exchanges of presents between the family of the bride and her husband; every present must be returned with another of equal value, and as the endowment must first be provided, it is for them a matter of some expense to be married. This endowment must be sufficient to maintain the wife in the position to which she was born, and as no Goajira will marry beneath his position, many of the men must remain without wives, though the greater number of them usually manage to obtain one, and polygamy is not so frequent among them as one might expect.

After the purchase of the bride has been negotiated with her maternal uncles, who fix the value of her social position, they are supposed to take charge of whatever is received, payment being usually made in cattle. Among the ruling classes a small herd is required, but with the poor people five goats are regarded as sufficient. The uncles, on receiving the property, take careful account of it and put the animals out on the range for pasture; there they are maintained and allowed to increase. If the man grows tired of his wife, he has simply to tell her to take her property and go home to her mother, and the divorce is complete; but if they live happily, which is usually the case, the property is divided among the wife's children, each taking a share as they reach a certain age. If the Indian dies, the wife takes her property; but if their children have already inherited it, they are morally obliged to care for her, and she becomes a person of great consideration in their household.

This custom works well when adhered to, but frequently the uncles, after disposing of the girl, appropriate the property and assume the responsibility of delivering it when occasion requires, and this leads to endless quarrels and disputes.

The Goajiras were once cannibals and are still said to practise that barbarity at times. Not long ago a Colombian, living at Rio Hacha, who had traded with these Indians for many years, disappeared, or rather never returned from one of his excursions to the Indian country. No man had ever been more popular with the Indians, and it was supposed that he had lost his life through some accident. His eldest son assumed charge of the business and in time became more popular even than his father had been. One day, while seated with the patriarch, or chief, who had been his father's greatest friend, and while they were eating a wild hog which the Indians had killed, and drinking a plentiful supply of rum, the young man said, "This hog is very good" (*sabrosa*, as they say in Spanish)—to which the chief, now fairly drunk, replied, "Yes, but your papa, he more *sabrosa* still; we eat him all up!"

The Goajira Indians have never been conquered; they break into small parties before their enemy and keep up a guerilla warfare, always retiring, but never giving up. At present they are quiet and generally well disposed, but this is owing entirely to the efforts of a party of Franciscan missionaries who some years ago went boldly among them and have since been accomplishing very much for their benefit.

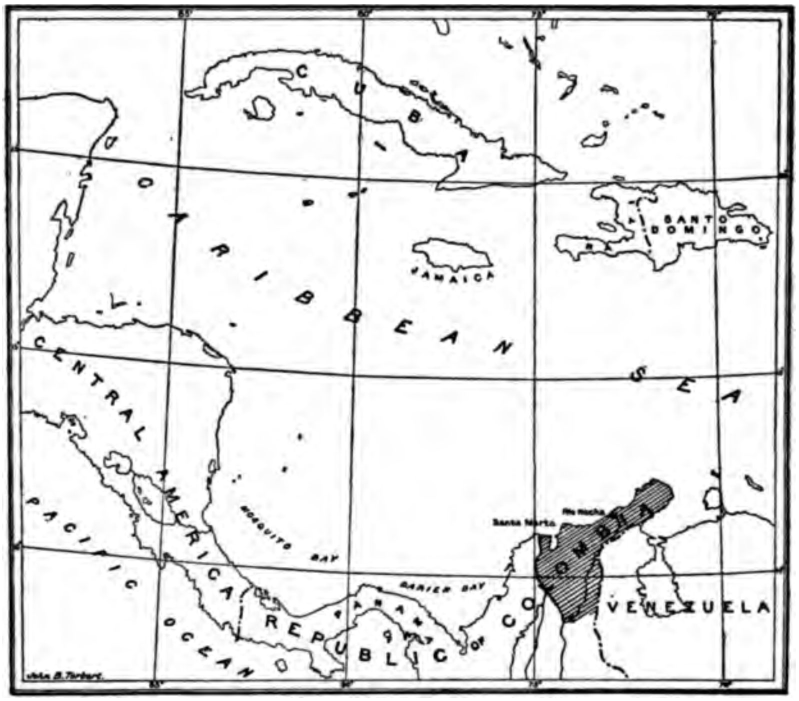


FIG. 72— The Province of Santa Marta, Colombia, and adjacent region.

THE LODGES OF THE BLACKFEET

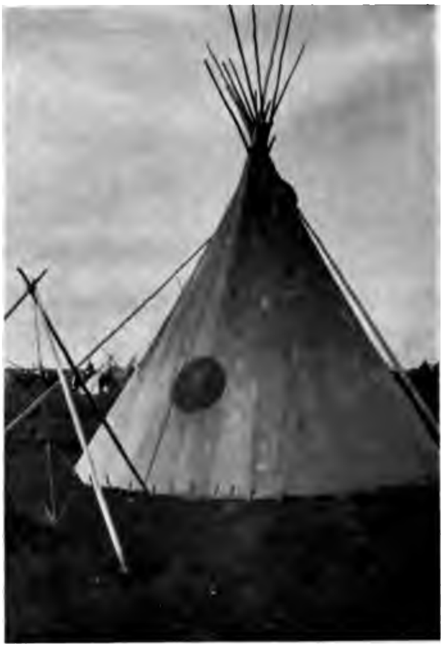
By GEORGE BIRD GRINNELL

The old-time skin lodges of the various prairie tribes have often been described, and in a general way it is well understood that they were made of buffalo hides, sewed together and stretched over a conical frame of slender poles, called lodge-poles. I do not know, however, that the detail of their manufacture, erection, and decoration has ever been fully explained, and it is certain that these operations differ more or less in the different tribes.

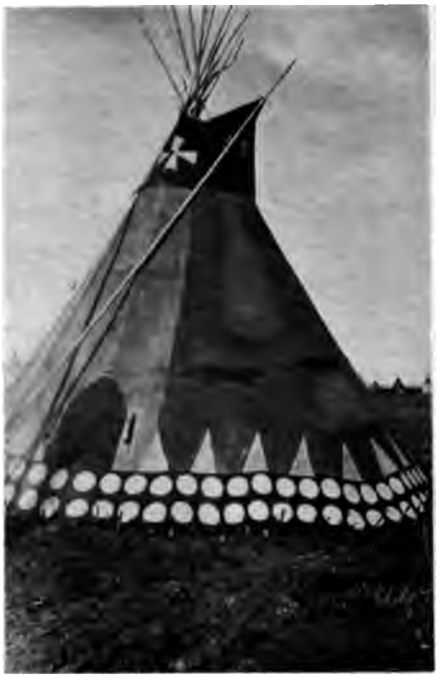
During a recent visit to the Piegan tribe of the Blackfeet Indians, I gathered the following notes as to the painting of their lodges. It must be understood that what is said with regard to the Piegans applies also to the Kaínah or Bloods, and to the Síksikau or Blackfeet.

The old-time lodges of the Blackfeet were made always of an even number of skins—eight, twelve, fourteen, sixteen, twenty, and sometimes even thirty, thirty-two, thirty-four, or thirty-eight skins. The very large lodges were unusual. They commonly contained two or more fires, as described in my *Blackfoot Lodge Tales* (p. 187). Such a lodge was a load too heavy for one horse to carry; it was therefore in two pieces, pinned in the front in the usual way by skewers running from the top of the door up to the smoke-hole, and, in later times, buttoned up the back with the old Hudson Bay brass buttons. Probably at an earlier date the lodge was pinned together at the back as at the front.

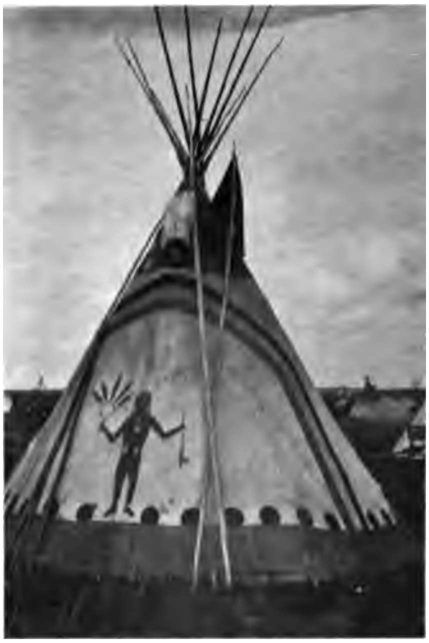
Lodges were made in the spring or early summer, and for this purpose the hides of the buffalo cow only were used. A lodge in



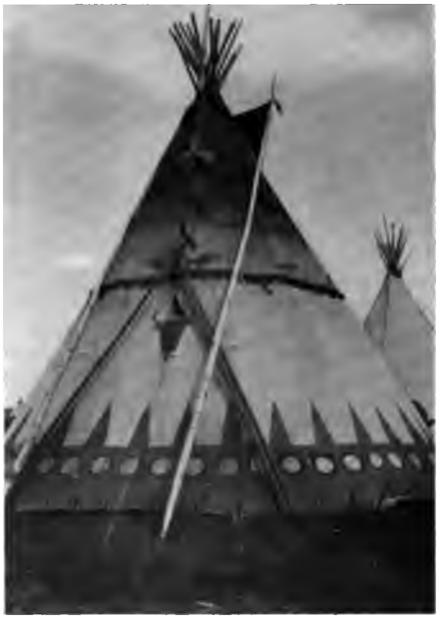
1.—Thunder-bird Lodge



2.—Yellow-painted Lodge



3. Head Carrier's Lodge



4 —Lone Chief's Lodge

LODGES OF THE BLACKFEET

constant use did not commonly last more than a year. Holes were worn in it in packing: an ill-trimmed lodge-pole might wear other holes. The frequent wetting and drying of the sinew caused the seams to open, and while the woman resewed them and put patches over each hole that appeared in the covering, it was likely, when the heavy spring rains came on, to leak badly and so to be uncomfortable. When this point was reached, the woman began to think of making a new lodge, and notified her husband that skins were required for a new lodge-covering.

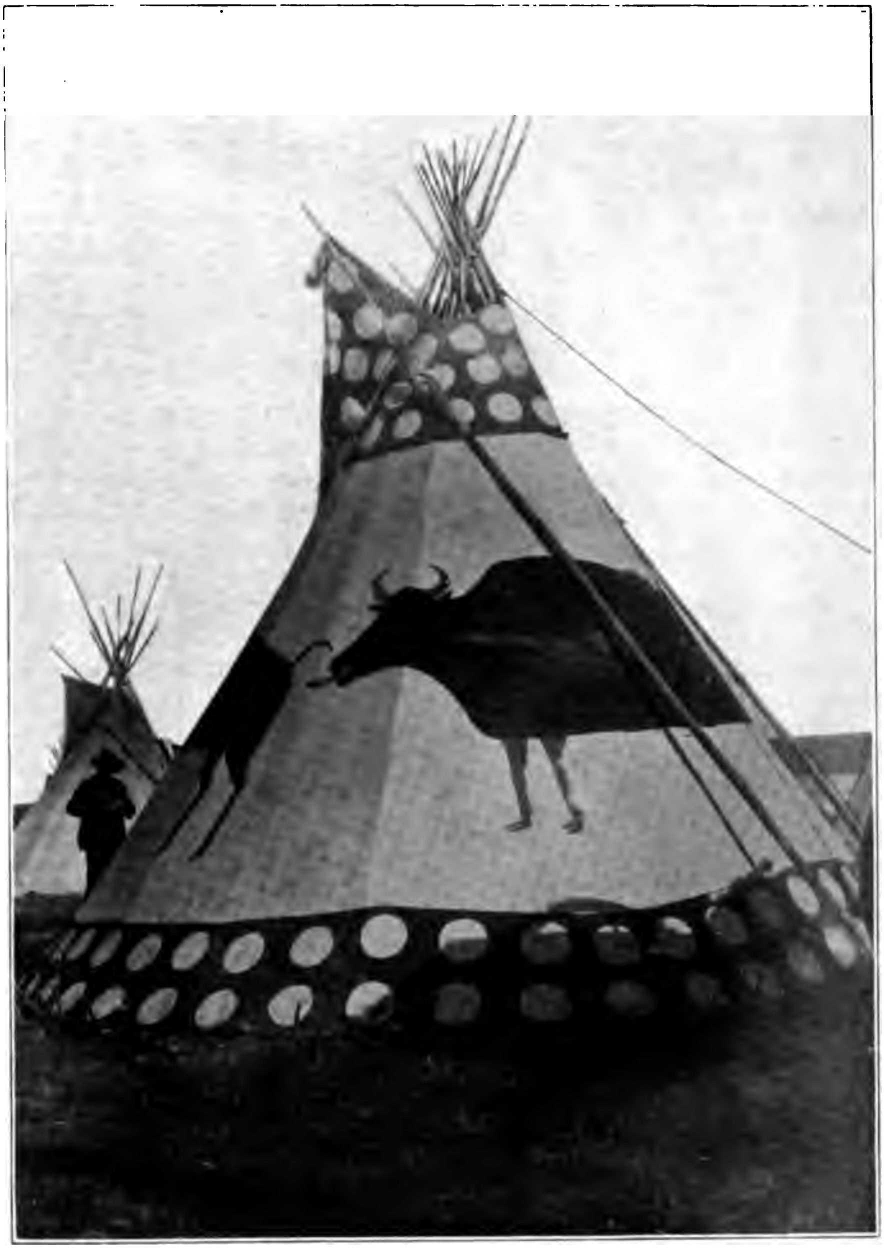
From the hides brought in by her husband, the woman carefully selected and laid aside those best adapted for a lodge-covering, and tanned them with special reference to the use to which they were to be put. She took pains also to save all the best sinews from the backs of the buffalo, taking off the straps in ribbons as long as possible—sometimes three or four feet in length.

When she had tanned the required number of skins, collected all the sinews needed, and prepared the necessary awls, the woman talked over the matter with her husband, and, having shown him that all was ready for the making of the lodge, he advised her to proceed. Meantime it was generally known through the camp that such and such a woman was preparing to make a new lodge. She now prepared a considerable supply of food, chief among which were kettles of boiled sarvis berries, and requested some old man to invite certain women to eat with her. The invitation was conveyed to the women early in the morning, and they were expected to come at once.

After the guests had come to the lodge and had eaten, the woman spoke to them, saying: "Friends, I am going to make a lodge. My skins and sinews and awls are ready, and now I wish for help to make the lodge." When they accepted the invitation, the women understood what it meant, and by accepting it they agreed to assist the lodge-maker. No direct reply to her speech, therefore, was needed or expected. After she had told them her wishes, she opened her bundles of sinews and distributed them among the women, each of whom carried a package away with her. It was the business of each to split the sinews she had taken to make thread for sewing the lodge-skins. The thread was made by splitting the sinew with the fingernail, wetting half the length of the strand in the mouth, twisting the end with the fingers so as to point it, and then, holding that end in the mouth, rolling the wet sinew between the palms of the hands for about half the length of the strand—sometimes two feet. The untwisted part was merely knotted at the end.

The next morning another group of women were invited to eat, as before. These were the sewers, and with them was called one known to be a good fashioner of lodges, who should be the cutter and designer. She carried the pattern of the lodge in her mind, and was guided only by her judgment. Like the thread-makers, these women came to the lodge in the early morning. After they had eaten, and the hostess had told them what she wished, the women began to rise and to leave the lodge. All around the border of the lodge, close up against the lining (and so immediately behind the people, who were sitting on the beds), were bundles of tanned skins—two or three tied up in a roll together. As the women went out, one by one, each picked up one of these bundles and carried it out with her. At a short distance from the lodge they stopped, untied their rolls of skins and spread them on the ground together, edge to edge, so as to cover an irregular square, and then sat down about them in a circle. Then the old crier called out for the thread-makers to bring the thread, and soon the women to whom the sinews had been given were seen coming, each bringing her bundle of thread which she placed on the hides just within the circle of the women, so that a bundle lay before each one.

Now, the old woman to whom the designing was entrusted arranged the skins on the ground to the best advantage, cut off a piece here, another there, indicated where a gap should be filled up by a patch, and then set the sewers to work. Each had been



BLACK-PAINTED BUFFALO-STONE LODGE

provided with her awl and thread, and they worked fast. The designer superintended the making, seeing that the half-circle was true and of the right length, that the various tapers were properly drawn and were the same on each side, and that the ears and the front-pieces were properly put on. All the other women sewed under her direction, and obeyed whatever orders she gave. From time to time food was carried out to the sewers, who stopped to eat as they felt inclined. The sewing was usually finished in a day.

The string or strap at the top and back of the lodge, by which the lodge-covering was tied to the back pole, required special treatment. It is by means of this back pole that the covering is raised so as to go about the framework. It was important that this piece of leather should be sewed to the lodge-covering by a woman particularly chosen, for, if it were sewed by a woman of jealous or quarrelsome disposition, the lodge would always be smoky, whether or not there was wind. So, a good-natured woman, one of cheerful disposition, was always chosen for the task of sewing on this piece.

When the women had finished sewing the lodge, they at once set it up and pinned down the sides close to the ground, put on a door, and closed the smoke-hole as nearly as possible. A fire was then started in it, and sagebrush thrown on the fire to make a thick smoke. This was done in order that the lodge-skins might be thoroughly smoked, so that they would never get hard when wet.

In putting up the lodge, the Blackfeet tie four poles together, and the remaining poles rest on the crotches of these four. The butts of the four tied poles are not set on the ground in a square with equal sides, but in a rectangle whose sides are longer than the front and back. The front of this rectangle faces east, while the back is to the west and the two long sides are on the north and the south. The remaining poles lean against the crotches of these four in a rough circle, much smaller than the circumference of the lodge is finally to be, and the lodge-covering is tied to the back pole, which is the last one put up. When the lodge-covering is put on, it is drawn about the frame until the borders meet in front of the lodge, and then a woman, mounting on a travois as a ladder, pins these borders together, using from fifteen to twenty-five slender skewers about the size and shape of the wooden skewers used by butchers. Other women now go inside and move the butts of the poles outward, so that the lodge shall be properly stretched. But the lodge may have to be used for some little time before it is thoroughly stretched and so tight that there is no danger of its leaking anywhere.

Often a new lodge-covering is put over poles that have been in use for years, but if new poles are to be made, these are chopped by the man and his wife on the edge of the mountains and brought into camp. A good-sized lodge requires twenty poles; a very large one, thirty. Obviously, the greater the number of the poles, the better a well-made lodge will be stretched, the tighter it will be, and the longer it will last. Some tribes use a greater number of poles than others, and those who use the most, commonly have the best lodges. When the new poles have been brought to camp, rough and with the bark and the stubs of the branches still on them, women are invited to eat stewed berries, and, after they have eaten, the hostess asks her guests to help her peel and trim the poles, and this work is commonly finished in one day.

If, for any reason, a lodge is persistently smoky, the Piegans are likely to shoot a blunt-headed arrow up into the smoke-hole, trying to hit the poles where they come together. This is supposed to remedy the trouble.

In old times the Piegans, when camp was made, used often to spread a buffalo-robe over the diverging lodge-poles above the smoke-hole; it was tied to one, two, or three of the poles. This brought them good luck, so that if enemies attacked the camp nobody would be hurt. It also made them light and active in their bodies, able to get about quickly, and to escape danger. It was an old custom, for which no reason can now be given.

The Piegans know the lodges of the Crows at a distance, because of the shortness of the lodge-poles. This gives the lodge a "cut-off" appearance, quite different from the lodges of the Blackfeet, of which the poles extend from four to six feet above the top of the lodge.

Besides this, the wings of the Crow lodges have pockets into which the poles fit, whereas the Blackfeet wings have eyelets in the tips through which the poles pass, and often, if the poles which support the wings are slender, little twigs are lashed across them near the ends to prevent them from passing too far through the eyelet.

No lodge—at least no properly made lodge—is actually conical in shape. All are more nearly vertical at the back than at the front. The backs of the lodges of many mountain tribes seem very straight,—almost at right angles to the ground,—while the slope at the front is long and gentle. The difference has relation to the stability of the lodge. The lodge is always pitched back to windward, and the inclined poles in front resist the force of the wind, so that the lodge cannot be blown over.

At the last Medicine lodge of the Piegan Blackfeet, I learned the history of a few of the painted lodges. It is to be understood that the painting on each lodge is the special property of the lodge owner, and can be used only by him unless he sells his right to it to another individual, in which case the buyer has the sole right to the design and to any "medicine" or mysterious power which may accompany it. In a majority of cases the designs or the medicine which belongs to them, or both, have come to the original painter of the lodge through a dream, and where this is the case, it is commonly indicated by the butterfly (*a-pŭn'-nĭ*) cross at the back of the lodge, immediately below the smoke-hole. I have already called attention to this sign and to its meaning.[1]

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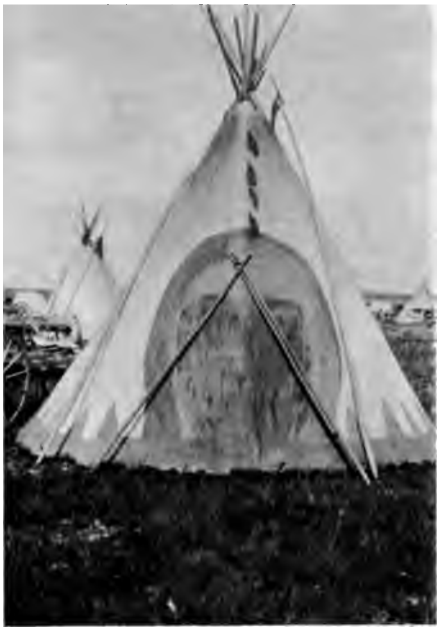
[1] *American Anthropologist* (N. S.), vol. I, p. 194, Jan., 1899.

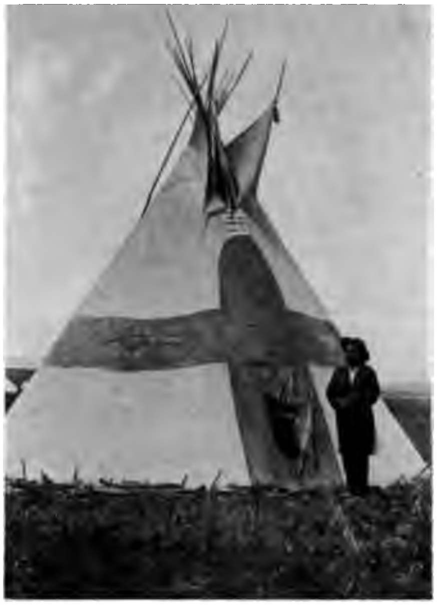
Among the lodges seen last summer was that known as the Thunder-bird lodge, in the erection of which a special ceremony must be observed. The reason for setting it up on this occasion was that a certain young man believed that he detected in the sky the signs of a storm, and, filling the pipe, took it to Iron Pipe, the owner of the Thunder-bird lodge. The young man told Iron Pipe that he wished to have fine weather during the Medicine lodge, and offered him the pipe. Iron Pipe accepted it, smoked, and began to pray. The putting up of the Thunder-bird lodge, and the ceremonies which attend it, always cause a storm to cease if one has begun, and insure fair weather. Before it is put up a sweat-house must be built, — the lodge-covering of the Thunder-bird lodge being used to cover the sweat-house, — into which the lodge-owner goes, takes a sweat, and prays. After this he paints his forehead and the backs of his hands yellow, and a small blue spot on each temple. His women who erect the lodge can do the work only if painted with yellow paint on the forehead.

While the women were bringing the lodge-covering from the sweat-house, where it had just been used, Iron Pipe himself was engaged in painting the back pole bright blue, and in tying a bunch of bells on the end of it. The lodge-covering doubled once was now placed on the ground just behind where the lodge was to stand; a lodge-pole was laid on it, and the distance measured from the base of the lodge-covering to the top of the smoke-hole. Another pole was measured along the other border of the lodge. After it had received its painting, the blue-painted back pole was not placed on the ground, but was rested on a tripod, the butt pointing toward the south and the raised point toward the north. The four poles, tied together at the points measured on two of them were set up as already described. But in this case, the tying not being altogether satisfactory, one of the younger women proposed that they should be taken down and a guy-rope attached to them.

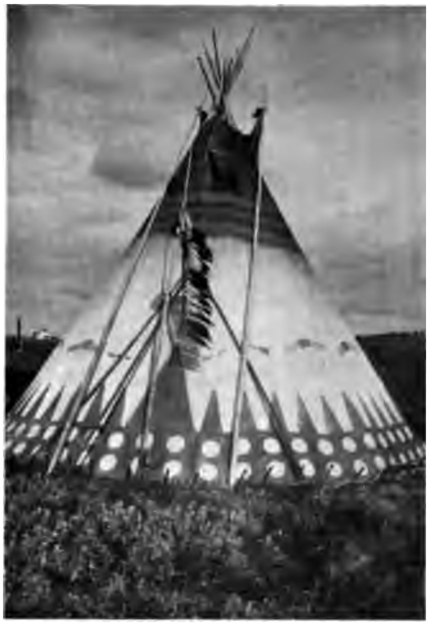
" No," said another older woman, " now it is up, it cannot come down."



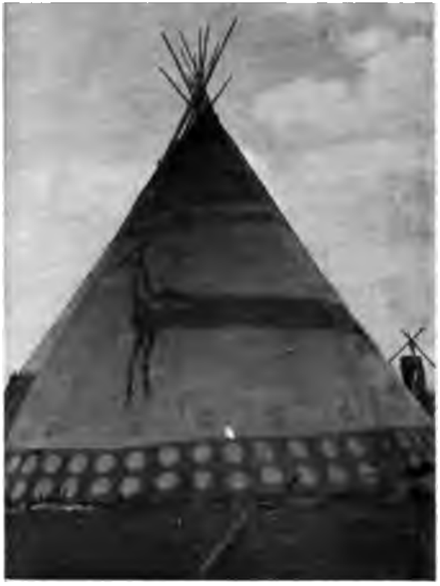
1.—Red Head's Lodge



2.—Single Circle Lodge



3.—White Dog's Lodge



4.—Short Robe's Lodge

LODGES OF THE BLACKFEET

When the lodge had been erected, it was seen that it was blue in color, — it being of canvas, — darkest above and pale near the ground. It was supposed to have been all one shade of blue, which represents the sky. At the back of the lodge, low down toward the ground, was painted a yellow disk nearly two feet in diameter. The northern half of this disk was dotted with small blue spots which represent hail; the southern side was plain yellow, meaning rain. The idea is, that before the rain reaches the ground it has turned — on the northern half of the circle — into hail. Above the middle of the yellow disk was the Thunderbird sketched in blue, with outspread wings and with a zigzag line — a lightning flash — running upward from its head (plate XX, fig. 1). A drum painted in a similar manner went with the lodge, and was hung on a tripod immediately behind it. No man on foot or on horseback, and no wagon may pass between the back of the lodge and the tripod on which the drum hangs. No noise must be made near the lodge, and the lodge owner would not consent to have his lodge photographed.

On this occasion, when the lodge had been erected, the threatening storm passed away and the weather became clear again.

The importance of the buffalo to all the prairie tribes is, of course, well understood. It furnished them with food, clothing, and shelter. From its hide they made lines and cinches, and with it they covered their saddles; the sinew gave them thread for sewing; they carried water in its paunch and also boiled meat in it; its ribs and its dorsal spines gave them their knives, and arrowpoints and hoes were made from the shoulder-blades; cups and spoons and ladles were fashioned from the horns; the hide of the neck formed their shields and gave them glue for their arrows and their bows; the head of the humerus was used to rub hides to make them soft; they braided and twisted ropes from the hair; the brain was used for tanning, and the fat from the bones was eaten; if the people were troubled with certain simple skin diseases, they rubbed their bodies with the gall mixed with the contents of the paunch, and this cured them. It is not strange, therefore, that among the prairie tribes the buffalo was regarded as a most important protecting spirit, and was the chief among all the animals of the plain.

Two of the most important lodges in the Blackfoot camp are known as the *Īn-ĭs'-kĭm* (buffalo stone) lodges. Both are painted with figures of the buffalo, and they came to the tribe long, long ago, "in about the second generation after the first people." Formerly all the Blackfoot tribes lived far to the north of their present home, yet these lodges are said to have been discovered near the place where the Síksikau now dwell. These lodges came to the tribe in the following manner:

One day, long, long ago, two old men, friends, had gone out from the camp to find some cherry-shoots with which to make arrows. This was on Bow river, below the Blackfoot crossing. After they had gathered the branches, they sat down on a high cut bluff on the river bank and peeled the bark from the shoots. The river was very high. One of these men was named Weasel Heart, the other, Fisher.

As they sat there, Weasel Heart chanced to look down into the water and saw the top of a lodge and its poles standing there above the surface. He could not believe that what he saw was actual, yet it was broad daylight, and, however hard he looked, the top of the lodge and its poles were there.

Weasel Heart said to his companion: "Friend, do you see any object in the water or on the other side?"

Fisher looked across the river and said, "I see only some buffalo."

"No," said Weasel Heart, "I do not mean on the prairie; look down into that deep hole in the river and you will see a lodge there."

Fisher looked as directed, and saw the lodge,—it was the black buffalo lodge. "Oh, yes," he said; "I see it, and I see another lodge standing in front of it." Then Weasel Heart saw that lodge too,—it was the yellow buffalo lodge.

They wondered at this and could not understand it; but they were both men of strong hearts, and presently Weasel Heart said: "Friend, I am going down to enter that lodge. Do you sit here and tell me when I get to the place." Then Weasel Heart went up the river and took a drift-log to support himself, and pushed it out into the water and swam down toward the cut bluff. When he had reached the place where the lodge was, Fisher told him, and he let go the log and dived down and disappeared from view.

For a long time Fisher sat there waiting for his friend; but at last, after he had been there for half the day, he looked down the stream and saw a man on the shore—it was Weasel Heart, who walked up the bank until he had reached his friend. Fisher said to him: "I was afraid that something bad had happened to you. I have been waiting a long time. You went into that lodge that you saw (the black buffalo lodge); now I am going to do the same thing, but I shall go into the other one."

Fisher went up the stream and then swam down, as Weasel Heart had done, and when he reached the place, he disappeared as Weasel Heart had disappeared, and the log he had been resting on floated down the stream. Weasel Heart waited for his friend as long as Fisher had waited for him, and when Fisher came out of the water, it was at the place where Weasel Heart had come out. He joined his friend and they went home to the camp.

When the two had come to a hill near the camp, they met a young man, and by him sent word that the people should make a sweat-house for them. After the sweat-house had been made, word was sent to them, and they entered the camp and went into the sweat-house and took a sweat, and all the time while they were sweating sand was falling from their bodies.

After this the people moved camp and went out and killed buffalo, and these two men took hides and built two lodges, and painted them just as the lodges were painted that they had seen in the river.

Now, the people wished to cross the river below the Blackfoot crossing, but as the stream was deep it was always a hard matter for them to get across. The dogs and the travois were often swept away, and the people lost many of their things. At this time the tribe wanted to cross, and Fisher and Weasel Heart said to each other: "The people want to cross the river, but it is high and they cannot do so; let us try to make a crossing so that it will be easier for them." So Weasel Heart, alone, crossed the river and sat on the bank on one side and Fisher sat opposite him on the other. Then Fisher said to the people: "Pack up your things now and get ready to cross; I will make a place where you can cross easily."

Weasel Heart and Fisher filled their pipes and smoked, and then each started to cross the river. As each stepped into the water, the river began to go down, the crossing grew more and more shallow. The people, with all their dogs, followed close behind Fisher, as he had told them to do. Fisher and Weasel Heart met in the middle of the river, and when they did so they stepped to one side up the stream and let the people pass them. Ever since that day this has been a shallow crossing. These lodges came from the Under-water people—*Sū'yē tŭppi.*

Certain of the *Īn-ĭs'-kĭm* are kept in these lodges in little bags. They can be kept only in these lodges, and by these lodge-owners.

The yellow-painted buffalo lodge has, surrounding the border, at the ground, a black band, fifteen to eighteen inches in width, on which are painted a double row of white disks, four to six inches in diameter. This is the night with its stars. The ground color of the lodge is yellow, while the buffalo are brown. The bull is painted across the front of the lodge, the cow across the back. The pinning of the lodge passes down behind the bull's shoulders. In the bull, the hoofs, the two eyes (both on one side of the head), the knees, tongue, genitals, kidneys, tail, and horns are green. The life-line is red and green in alternate blocks, and the heart is green. A spot between the horns, and the insides of the ears, are red. The cow has the tail, kidneys, hoofs, ankles, horns, tongue, ears, two eyes (on one side), and the nostrils red. The life-line is red and green. In each animal the tongue protrudes; each is licking the rump of the other. Below the smoke-hole at the top is the butterfly cross.

The black buffalo lodge (plate XXI) has the black band at the ground with a regularly-spaced double row of disks representing stars. The buffalo bull and cow are black on white ground. The bull is at the front of the lodge, its pinning passing down just back of the shoulders. The tongue, two eyes, horns, hoofs, front pasterns, heart, and genitals are green, the nostrils, inside of ears, a spot between the horns, the wrists, hind pasterns, hooflets, kidneys, tail spot, and hocks are red. The cow is similar, except that the tail spot is green. At the back of the lodge there is a green butterfly cross; the wings are black, painted with stars, and the points of the wings carry buffalo tails and hoofs.

The two lodges last mentioned are situated on the northwest side of the camp-circle, and are not far apart.

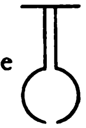
On the southern side of the circle is a lodge belonging to Head Carrier (plate XX, fig. 3), an old man of some importance and possessed of some spiritual power. The painting of this lodge is very old, and I have no adequate explanation of it. The black band close to the ground is unmarked, but above, and resting on it, are a number of black, roughly circular paintings, which represent the heads of enemies. On the front and on the back, and so with their extremities almost touching at the ground on either side, are two rainbows in three colors, red, blue, and black, from below. Each runs from the black band at the ground nearly to the smoke-hole, and so forms a high, narrow arch. Within the rainbow, at the back, is the full-faced figure of a naked man, about three feet high. The figure is painted in reddish brown, but the hair, heart, life-line, and kidneys are bright blue. The man holds in his left hand a pipe, which he is filling in order to give the sun a smoke. In his right hand he holds, by its handle, an object with the outlines of an ordinary palm-leaf fan, from the outer border of which project a number of eagle tail-feathers. These tail-feathers he is about to present to the sun. The butterfly cross is below the smoke-hole, in the usual place.

Growing Buffalo's lodge shows on the south side a male mule-deer, and on the north side a female mule-deer. The color of each is bright yellow; the life-line is red and green in alternating blocks. The kidneys, knees, hoofs, and rump patch are green, the teats and genitals red.

White Dog's lodge (plate XXII, fig. 3) shows the usual band with the stars at the ground, and resting on this band are conical or oval figures, the conventional signs for mountains. Besides these, at the back of the lodge, and resting on the band, is another conventional sign—that for a pine tree, a broad, sharp cone, from the sides of which project slender, upright lines a few inches long ; this is yellow. Almost half-way up the lodge, on the south side, is a male snake, and on the north side a female snake ; these are red, yellow, and blue, in sections. At the top of the lodge, below the smoke-hole, are three narrow red and three narrow yellow bands alternately; these represent red and yellow clouds. The very top of the lodge and the wings are black (the night), with six stars (the Pleiades) on the wings.

Red Head's lodge (plate XXII, fig. 1) has the base-band red, and resting on it are the conventional mountains. At the back and front of the lodge, rising well toward the smoke-hole, are great red paintings three or four feet wide, six or eight feet high, rounded above and resting on the band below. These represent the great masses of rock often seen on the prairie, and against which the buffalo used to rub themselves — erratic bowlders dropped by the glacier. Hanging down from the smoke-hole behind are four horse-tails. They represent four horses stolen by the maker of the lodge.

Stingy's lodge is old and faded. The band below contains large circles—stars. Above, about half-way up the lodge, an undulating band, twenty inches wide, runs around the lodge; it is composed of three narrow brown and two narrow red stripes. The lodge owner — not a very intelligent man — believed it a snake; I thought it more likely that it represented the rolling prairie, but old Running Rabbit, an excellent authority, declared it to represent a river. Above this band, on the south side, is seen a male eagle in flight, showing one of the wings; and on the north side a female eagle flying, also showing one wing. The lodge-wings bear, on the north side, four stars which represent the Pleiades, and on the south side seven stars—the Great Bear or Dipper. Behind and below the smoke-hole is the butterfly cross with the horse-tail hanging from the middle. The horse-tail brings good luck; he who has it on his lodge is likely to be fortunate in securing horses, and to have many of them. Also it is suggested that the lodge is sold for horses.

Three Bears' lodge has around the bottom a yellow band showing stars, and with mountains resting upon it. Above that it is unpainted until the smoke-hole is reached; about this the lodge is painted yellow, and hanging down from this yellow painting, the border of which is horizontal, are pairs of conventionalized eagle-claws, as shown in the figure . The claw to the south is blue, and the one to the north, yellow. The wings show stars—the north wing the Great Bear, the south wing the Pleiades. At the back, below the smoke-hole, is a representation of the sun with a horse-tail tied to the center. Above, and on either side of the door, is a blue painted circle, in the center of each of which are bells and a bunch of raven feathers, and from the center of these circles run the strings by which the door hangs. This door must be a calf skin with the fur left on it.

This lodge was discovered in the following way: Once a man with his son was out in winter hunting buffalo, and as they were returning to the camp, the two were overtaken by a severe snow-storm and lost their way. They made a shelter for themselv from the green hides that they were carrying, and lay down in and slept. In his sleep the man dreamed that a person came him and said, "Friend, I invite you to come to my camp." I accepted the invitation and his host told the lost man that l wished to make him a present of a lodge. In front of his ov lodge the host put down two blocks of wood, painted differe colors, and requested the lost man to take his choice. He did s and the block which he chose was painted as this lodge is painte When the lost man awoke, the storm had ceased and the sl was clear, and with the boy he went home to the camp. Wh spring came he made himself a lodge and painted it as he h seen the painting on the block of wood.

After that, no matter how dark the night or how bad the stor this man never lost his way; the lodge brought him good luck

Old Running Rabbit's lodge is called the Single Circle lodg It has only a single ornamental circle about it (plate XXII, fi 2). The man who designed it had the same name and gave h name to the lodge. He sold it to Red Crow, chief of the Bloods lately dead. Running Rabbit's wife is a sister of Red Crow. R Crow gave the lodge to his son, Lop-eared Wolf (*Mak-wŭyē-pi tōki*), and Running Rabbit's wife received the lodge from h nephew. Single Circle Lodge was a beaver priest, and this lod undoubtedy had its origin from the Beaver society. Its disco erer dreamed that the otter and the beaver gave him the lodge.

About the lodge, four or five feet above the ground, runs band of red, two feet wide, on which are shown six black otte three on each side, all running from back to front. The femal are on the north side and the males on the south side. T white teeth and red mouths are shown, as if half the face had bee cut away. The life-line is alternately red and green. T kidneys are green; except for this the animals show black. I front, extending from the ground up on either side of the do and almost to the smoke-hole, three feet wide and rounding o above, is a solid mass of red which represents the rock in the bank where the otters lived. At the back of the smoke-hole, high up, is a green moon with a narrow yellow border, and to the center of the moon is tied the luck-bringing horse-tail. Within the lodge, just above the door, is a rattle made of calf-hoofs with a calf's tail hanging down, to announce the arrival or departure of anyone entering or leaving the lodge, since, whoever goes in or out is quite sure to touch the calf's tail with his head.

The painting of a skin lodge, the only one now in the tribe, which has been made at my request for the American Museum of Natural History, formerly belonged to Calf Rib. The band at the ground shows the circular stars, and on it rest mountains alternating with cat-tail rushes. Black and red bands above represent clouds. The stars on the wings are the Pleiades on the south and the Great Bear on the north. At the back is the butterfly cross. On either side is to be painted a panther, and a conventional pine tree will show at the back. The panthers will be in black. This lodge is called the mountain-lion lodge, or the partly-black-painted lodge.

The yellow-painted lodge (plate XX, fig. 2), or the otter lodge, belongs to George Starr, an English-speaking half-breed. It shows at the ground a black band with stars, and on the band rest mountains alternating with cat-tail rushes. At the front and back are two great red rocks—that at the back with a mink running up either side, that at the front with a weasel running up either side. The ground color of the lodge is yellow. Eight otters, four on either side of the lodge, run from the back to the front. The male otters are on the south side and the females on the north, and the same is true of the minks and the weasels. The otters are very dark brown or black, with red kidneys, and red and blue life-lines. The butterfly cross below the smoke-hole at the back is blue, with a horse-tail attached to it. The top and wings of the lodge are black and show the constellations—the Great Bear on the north side and the Pleiades on the south.

Dan Lone Chief's lodge (plate XX, fig. 4) shows at the ba band of red sky with a single row of stars; mountains rest u the band. About five feet from the ground, at front and b are full-faced buffalo-cow heads with the tongues hanging Higher up is a fringe of buckskin sewed to the lodge-coveri and on this buckskin as a path, on either side of the lodge, five ravens walking toward the front of the lodge. Each ra holds in its bill a piece of red flannel representing a bit of fl Above, and just below the smoke-hole are three bands, two and one yellow, which represent sunrise clouds. The black (the night) shows about the smoke-hole and on the wings, w the Great Bear on the north wing and the Pleiades on the sou At the back is a blue butterfly cross, and five horse-tails h down below it.

Short Robe's lodge (plate XXII, fig. 4) shows a red band bel with a regular double row of stars. About two feet above t and running all around from one side of the door to the other a set of double deer-tracks. The hoofs are blue, the d claws yellow, and the pasterns red. Above, a long female m deer, yellow in color, shows on the north side and a male on south side. The nostrils, eyes, a round spot in the ear, kn kidneys, hoofs, hocks, and rump patch are blue; the life-line red and blue; the coloring in the two animals is the same. Abo near the smoke-hole, are bands, three in all, showing red white clouds. The Dipper appears on the north wing and Pleiades on the south wing.

A lodge dreamed of by Little Plume, but never his property that of anyone else, had at the bottom a wide red band running about it from one side of the door to the other, representing red morning cloud. Just above this, at the back, was the mo ing star; about half-way between the morning star and smoke-hole was the sun, and close under the smoke-hole, in edge of the black painting which represented the night sky, the moon.

In this lodge-painting among the Blackfeet various sacred objects are commonly represented by certain conventional symbols. Red, white, and blue bands stand for the red morning cloud, the white cloud, and the blue sky; black indicates night; white circles are stars, rather tall cones are mountains, half-ovals are rocks. The pine tree, the cat-tail rush, and various birds and animals are readily recognizable. Perhaps of all the signs used, the least expressive are the eagle claws seen near the top of Three Bears' lodge.

The symbols by which the different objects are shown are not intricate, but simple. All of them appear to be true copies of nature according to the Indian school of art. It may even be questioned whether they should be called symbols rather than pictures.

It is interesting to note that it is the custom of lodge painters always to show the male animal on the south side of the lodge, while the female is placed on the north side. I have been unable to procure from the Indians an explanation of this, but it is almost always the case except in the *Īn-is'kim* lodges, where the male is on the east or front, and the female on the west or back of the lodge.

The night with its journeying stars is mysterious. The Sun is the most powerful of the gods, and his daily coming the most important event of the Blackfeet's lives. The red cloud which represents his rising, the Thunder-bird standing for the dreaded lightning, the rainbow symbolical of the clearing storm, represent the powers of the Above people.

The powers of the earth are evident in the figures of the mountains, the most impressive natural features that the Blackfoot sees, and still more strange and mysterious to him because—a true prairie dweller—he never ventures into them nor explores their narrow defiles and dark recesses. Certain mountains are prayed to, and I have elsewhere quoted a prayer made by an aged Blackfoot to Chief mountain. Many of the rocks and

bowlders scattered over the prairie—especially if odd or unus
in shape—possess a sacred character; they are prayed to, a
gifts are offered to them.

The animals which inhabit sky and earth and water are pote
in various ways, and their help is needed as well. Of all of th
the buffalo has the greatest power, but that of the deer and t
elk is also great. Birds in general possess power, but the ea
and the raven are especially strong helpers. The Under-wa
animals are powerful, as shown by the many stories told of the
Of them all the most sacred is the beaver, to which the otter
supposed to be related. The mink is another under-water anim
and the weasel is related to it. The skins of all these *Musteli*
are extensively used for ornament.

The paintings on the lodges represent sacred animals or
jects which possess protective power, and the painting w
adopted and is continued to insure good fortune. It is ana
gous to certain acts performed today by some sects of t
Christian religion, as offerings to patron saints. The paintin
thus require no special explanation and need be accounted for
no elaborate theory.

SIGNIFICATIONS OF CERTAIN ALGONQUIAN ANIMAL-NAMES

By ALEXANDER F. CHAMBERLAIN

The present paper embodies, in very brief terms, some of the results of a rather extended study in Algonquian sematology carried on by the writer at various times during the last few years. Besides his own investigations, recourse has been had to the researches of Baraga, Cuoq, Lacombe, Maclean, Tims, Rand, Trumbull, Gatschet, Brinton, Tooker, and others, and the standard dictionaries and vocabularies published by divers of these authorities.

ANTELOPE. — Cree *apistatikkus*, "little caribou"; Blackfoot *sauki awakos*, "prairie deer."

BASS. — Massachusetts *m'suggig*, "great (fish)." In Ojibwa the black bass is called *manashigan*, "ugly *ashigan*,"— the last word being a general term for fish of the bass sort. Out of *manashigan*, by folk-etymology, the French of Canada have made *mâle achigan*, as if the word signified "male *ashigan*."

BAT.—For Ojibwa *papakwanadji* (or *apakwanadji*, *pakwanadji*), Nipissing *pakwanatshenjish*, Cuoq favors the etymology "blunderer, blind-flier," saying that *pakwanatcenjic* is a contraction of *pakwana pineshenjish*, "l'oiseau incertain qui va au hasard." Cree *apakkwâtis*, "covering." Cuoq's etymology is not altogether satisfactory. Some identify, etymologically, all these words in the sense of the Cree term, the reference being to the skin-covering (wings).

BEAR. — For Cree *maskwa*, Ojibwa *makwa*, Delaware *machque*, etc., Brinton suggested a derivation from the radical seen in Cree *mokku*, "to tear in pieces." This, however, is doubtful, although "tearer" is an appropriate name for this animal. In Cree o name for the grizzly is ***mistaya***, "great animal"; for the polar be ***wâpask***, "white"; for the black bear, ***wâkayos***, "crooked creature

BITTERN. — Ojibwa ***moshkaosi***, "the bird that comes up aft entering the water." Another Ojibwa name is ***ganawabimogis*** ***weshi***, "the bird that looks at the sun."

BOBOLINK. — Ojibwa ***manominikesi***, "the bird that picks wil rice." The same term is given by some authorities for "snipe (q. v.).

BUFFALO. — The etymology of many of the Algonquian tern for "buffalo" is very obscure. Instead of the more gener ***mustus*** and ***pijiki***, the Cree and Ojibwa use also ***makutewimust*** and ***mashkote pijiki***, respectively, both signifying "prairie bu falo." The Micmac ***mestagepegajit***, according to Rand, mea "solid ribbed." To Brinton the Rev. A. S. Anthony, a Canadi Delaware, explained the Lenâpé ***sisiliti*** as meaning "the anim that drops its excrement when in motion"; but in the Lenâp English Dictionary, edited by these two authorities, the entry ***sisilija***, with the explanation "an animal that butts against ar breaks in pieces."

CARIBOU. — Micmac ***kalibu*** or ***χalibu***, "scratcher, pawer (i. of snow to find food in winter)." This etymology, given b Gatschet, seems to settle the origin of this word, which has pass into French, English, etc. (See this magazine, vol. III, p. 587.)

CATERPILLAR. — Cree ***miyawemottew***, "hairy worm." Men mini ***mashan***, Cree ***masan***, Ojibwa ***masan***, Nipissing ***manza*** Mississaga ***mᴇsons***, "fuzzy thing," appear to be applied som times to both the caterpillar and the nettle, but in the first thr dialects as a rule to the former only.

CATFISH.—Lenâpé ***wisamek***, "fat fish"; ***walheu***, "hole-digg (in mud of river bottom)." Ojibwa ***manamek***, "ugly fish."

CHIPMUNK. — Lenâpé ***pochwapiith***, "he sits upright on som thing."

CORMORANT. — Ojibwa ***kakakishib***, "raven duck."

CRANE. — Ojibwa *shashaki*, " the bird that holds itself erect."

CRAWFISH. — Cree *asâkew*, Ojibwa *ashage* (or *ashageshi*), "it moves (runs) too and fro, backwards and forwards." Lenâpé *schahamuis* belongs to the same etymological group.

CRICKET. — Lenâpé *tschelotschelos* is said to be an imitative word. In Ojibwa the same term, *papakina*, is given for both cricket and grasshopper. See GRASSHOPPER.

CROW. — Cree *ahâsiw*, " the bird that cries *ha ha* "; Lenâpé *ahaso*. Micmac has for crow, *kakakuch*, and Menomini *kakaki;* but most of the other dialects use the words of this series for raven. In a number of the Algonquian dialects the terms for crow and raven seem to have been mixed. See RAVEN.

DEER. — Cree *apistimosus*, " little moose." In the dialect of the northern Cree the mule-deer is called *kaskitchewayowew*, " the tail is black " ; another Cree name is *kwaskwepayiw*, " the jumper." The Virginia deer is called in Cree *wâpayowew*, " its tail is white." Cuoq gives the following terms as being applied by Nipissing hunters to the deer at successive epochs of its life: 1, *kitakakons;* 2, *manishinj;* 3, *papatakiwinens;* 4, *ningitaawanji;* 5, *kiponagosh;* 6, *saswewinens*. The first of these words signifies " little spotted (dappled) "; the second signifies also colt, and is applied to the young of the large quadrupeds; the fourth refers to the " bifurcation " of the horns; the fifth, like Cree *piponâskus*, properly signifies " an animal that has already lived one winter "; the last refers to the fact that the animal's horns are " divided into several branches." Lenâpé *mamalis*, fawn, means " striped."

DOG. — The etymology of the widespread Algonquian term represented by the Cree *atim*, Ojibwa *animush* (a diminutive of *anim*, now obsolete, = *atim*), Lenâpé *alum*, Micmac *ulamuch* (= Ojibwa *animush*), etc., is uncertain, although Trumbull considers the word to signify " seizer, tearer." Another Lenâpé word, *moekaneu*, means, according to Brinton, " tearer." The same language has also a word *lenchum* (or *lenochum*), signifying " the animal belonging to man." See WOLF.

DRAGON-FLY.—Ojibwa *obodashkwanishi*, Nipissing *abodji*
tikwanisi, "the flying creature with its head the wrong way."

DUCK.—The widespread term represented by Cree *sis*
Ojibwa *shiship*, etc., is said to be onomatopœic. In Ojibwa t
fall duck is called *pikwakoship*, "humped-back duck"; and t
other species are known as *kinishtinoweship*, "Cree squaw duc
and *ginogweiaweship*, "the duck with the long tail," while a thi
is *amikoship*, "beaver duck." In Cree a duck resembling the j
is called *wiskatjânisib*, "jay duck." Micmac *sesip* means "bir

DUCK-HAWK.—Menomini *pokaqtshiki*, "the hitter."

EAGLE.—Cree *mikisiw*, Ojibwa *migisi*, "the barker." Ot
names for eagles in Cree are *piponasiw*, "winterer"; *asponasi*
"greedy one." The etymology of the name for the golden eag
Cree *kiyuw*, Ojibwa *kiniu*, is uncertain. The white-headed ea
is called in Ojibwa *wabishakwe*, "its head is white"; and the
are like names in several other dialects.

EEL.—Cree *kinebikoinkosew*, "snake fish." Ojibwa *pim*
"greasy creature." Lenâpé *schachamek*, "smooth (or slippe
fish." This last is Tooker's etymology, which is preferable to th
offered by Rev. A. S. Anthony, "straight fish."

FIELD-MOUSE.—Cree *potatchiwesis*, "little puffer." Ojib
nanapatchinikesi, "the creature whose anterior limbs are wrong
placed (or formed)." See MOUSE.

FIRE-FLY.—Ojibwa *wawatesi*, "the creature that gives fo
flashes of light." Lenâpé *sasappis*, "flasher."

FLYING SQUIRREL.—Ojibwa *shagashkandawe*, "the creatu
that goes flattened (or crushed)." The Cree *sanaskâttawew* sig
fies about the same thing.

FOX.—The Ojibwa *wagush* seems to be derivative (diminutiv
from a root *wak* (*wag*), of uncertain meaning. The Lenâ
woakus is the same word, which also appears in some Cree diale
although the common term in that language is *makkesis*, perha
related to *makkisiw*, "it is large." The Cree name for the Arc
fox is *wâpakkesiw*, "white fox," and for the yellow (or brown) f

osawakkesiw, "yellow fox." A Cree name for the kit fox is *watchikumisis*, "lousy thing." Lenâpé *wulalowe*, "beautiful tail," is given in the dictionary, but a note by Rev. A. S. Anthony says "this may be an error for *w'halowes*, 'bushy tail', which is the present name of the animal."

FROG.—Ojibwa *omakaki* is said to be of onomatopœic origin, but the word is possibly identical with the Narragansett *omuckakee*, "it is bare (or hairless)." Another Ojibwa name for a small species of frog is *pikonekwe*, "deformed (or prominent) head." Lenâpé *olelu* and Nipissing *omamano*, "bull frog," are imitative of the croak of the creature.

GOOSE.—A widespread term for wild goose is seen in Cree *niska*, Ojibwa *nika*, Nipissing *nika*, the etymology of which is not clear. From *nika*, according to Cuoq, *nikamo*, "to sing," really signifying "to talk wild-goose," is derived. A species of goose called in Cree *wehwew*, Ojibwa *wewe* (probably from its cry), has given rise to the Canadian English *wavy*. A kind of gray spotted goose is called in Cree *tchakipases*, "it is spotted (marked)."

GOPHER.—In Cree the "striped gopher" is called *sasakawabiskus*, and in western Ojibwa *tatchikokanasi*, the last having reference to the stripes on the back of the creature, and the first part of the first to the conspicuous fur. The northern Cree call the northern pocket gopher *potatchikasiw*, "blower (puffer)," and the Ojibwa *potadjipingwese*, "the creature that blows the dust"; —by means of the pouches at each side of its mouth this animal blows up the loose earth, and thus makes a hole, hence the Indian name. The gray gopher is called by the Ojibwa of the region north of Lake Superior *apistinakwachasak*, "little squirrel." To the Cree and the northern Ojibwa the gray-headed spermophile is known as *apistanaskus* and *mistachitamo*, respectively; the former signifying "little badger" and the latter "big squirrel."

GRASSHOPPER.—Cree *papakines*, Ojibwa *papakine*, possibly "it makes a crackling noise." Menomini *kakuene*, "the jumpe Lenâpé *ktschukquilques*, "it moves in the grass." See CRICK

HARE.—The prairie hare or jack-rabbit is called in Cree *mis* *pus*, "big rabbit." The "varying hare" or rabbit is in Cree *wâp* Ojibwa *wâbos*, from the root *wâp* (*wâb*), "white," in reference the color of the animal. In a number of dialects *wâpus* or *wâ* is the name of both the hare and the rabbit. See RABBIT.

HAWK.—Ojibwa *gibwanasi* (*kipwanasi*), "the bird that chol or stifles." A sort of screech-hawk or sparrow-hawk is called Ojibwa *sakwatamo*, Cree *sakwatamow*, "crier (screecher)."

HORNET.—Lenâpé *wapotis*, "its hinder parts are white." several dialects (Cree *amow*, Ojibwa *amo*, etc.) the same wo serves to indicate "bee, and hornet," while Micmac *amooow* sig fies hornet in particular. The Micmac word for honey-bee *mechipehamooech*, "the insect that stores up food."

HUMMING-BIRD.—Ojibwa *nonokasi* (*nonokasins*), Nipissi *nonokase*. Cuoq seems to consider this word equivalent *nonoka-si* ("the bird *nonoka*"), so called "after the noise it mal in flying,—or from *nonoka*, a reduplication of *noka*, 'frail (slende or, again, from the root *non*, 'to suck.'" Of these suggested rivations the second is probably the correct one. Powell[1] sta that "in Chippeway (Ojibwa) the word for humming-bird *nononokausee*, i. e., 'an exceedingly slight (delicate) little creatu The Cheyennes call it *makaitaiwikis*, 'the iron bird.'"

INSECT.—Cree *manitos*, Ojibwa *manitons*, Nipissing *manito* are deterioratives of *manito*, "supernatural being, spirit."

JAY.—Ojibwa *tindese*, Nipissing *tendese*, according to Cu "the bird whose cry is *tenh*." Another Ojibwa word is *pikw* *kokweweshi*, Nipissing *pikwakokwewesi*, "the bird with the (rounded) head,"—this derivation is better than the ot suggested by Cuoq, "the bird with the voice of a cracked kettl In Cree the blue jay is called *wisketjân* (or *wisketjâk*), from wh by folk-etymology, have come the "whiskey John" and "whisk

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[1] *Introd. to Stud. of Ind. Lang.*, p. 66.

Jack" of the English of the Canadian Northwest. Another sort of jay is known in Cree as *apistikakakis*, "little crow."

KINGFISHER.—Ojibwa *ogishkkimanisi*, Nipissing *ogishkkimanisi*, according to Cuoq, "the bird whose cry resembles the noise made in passing a knife over a whetstone (*kishkkiman*)." The Menomini *okaskimani* is the same word with the *-si* (*-se*), "bird," as perhaps also Lenâpé *tiskemanis*, "little fisher bird."

LARK.—Ojibwa *kikibikomeshi*, Nipissing *kikipikomesi*, "the bird that poises (balances) itself in flight." Compare one of the Lenâpé words for bird, *awehellea*, "self-suspended," in reference to its flight.

LIZARD.—Cree *osikiyas*, "the creature with the wrinkled skin." In Ojibwa a sort of "red lizard" is known as *kwisens*, "little boy." A species of water-lizard found in Lake Huron is known in Ojibwa as *otawagameg*, Nipissing *otawakamek*, "ear-fish," the reference being to the gills.

LOCUST.—Cree *okwaskuttisis*, "little jumper,"—applied also to the grasshopper. In several dialects the same word (Cree *papakkines*, Ojibwa *papakine*) is used for both grasshopper and locust. See GRASSHOPPER.

LYNX.—Cree *pisiw*, Ojibwa *bisiw* (*pishiu*), Narragansett *pussough*, possibly "tearer in pieces." From this word are formed in several dialects the terms for the larger felines with which the Indians have become acquainted through the whites.

MACKEREL.—Penobscot *mamalamekg*, "spotted fish."

MARTEN.—Ojibwa *wabijeshi*, Nipissing *wabisheshi*, northern Ojibwa *wapisis*, northern Cree *wapsesiu*, Cree *wâpistan* (the diminutive *wâpistanis* is more common),—all derivatives from the root *wâp* (*wâb*), "white." Lenâpé *woapchwees* belongs in the same group.

MASKINONGE.—Ojibwa *maskinonje*, Nipissing *mashkkinonje*, "ugly pike (fish)." In the French of Canada, by folk-etymology, the word sometimes appears as *masque allongé*. To the English of America this Algonquian word has furnished *maskinonge*, *muscalonge*, *muskalunge*, and, by decapitation, *'lunge*. See PIKE.

MENHADEN.—Narragansett *munnawhatteaug*, according Trumbull, "fertilizer (that which manures)."

MINK.—Cree *atchakas*, according to Lacombe, "its genit are small,"—a "decenter" word for the same animal is *sakwes* which is evidently identical with Ojibwa *jangweshe*, Nipissi *shangweshi*. Lenâpé *wininkus*, probably referring to the "d gusting odor (uncleanness)" of the animal.

MINNOW.—Ojibwa *gigosens*, "little fish."

MOLE.—Cree *opotatchikesis*, "the animal that blows up t earth." Ojibwa *gagibingwekwe*, "blind head." See MOU SHREW.

MOOSE.—Cree *monswa* (*moswa*), Ojibwa *mons* (*mos*), Nipissi *monz*, Lenâpé *mos;* probably "the eater," in reference to browsing on twigs, leafage, etc.

MOUNTAIN-GOAT.—In Cree the Rocky Mountain goat called *wâpatik*, "white deer."

MOUNTAIN-SHEEP.—Cree *mâyattik*, "bad deer."

MOUSE.—Ojibwa *wawabigonodji* (*wawabikononshi*), Nipissi *wawabikinotshenjish* (a diminutive of *wawabikonotsh*, or *wabi notsh*), "white clay animal." The northern Ojibwa have the si pler form *wapikanotchi*. From this word for mouse are formed several dialects the words for rat, i. e., "big mouse." See SHRE

MUSK-OX.—Northern Cree *matechmustus*, "ugly moose."

MUSKRAT.—Cree *watjask*, Ojibwa *wajashk*, Nipissing *wajas* Cuoq suggests a derivation from *wadjaho*, "to hunt," and *as* "plants (rushes)," the word then signifying "hunter in t sedge"; another etymology suggested also by him makes mean "the animal that makes its cabin (*wadj*) in the sedg Both these derivations are unsatisfactory. Lacombe (accide ally, perhaps) enters the Cree word under the root *wat* "mountain," probably in reference to the mound-like nest of t animal. Another Algonquian term for muskrat is seen in t Virginian *muscassus* (*muscascus*) reported by the early write from which has come the *musquash* of American English.

Abenaki *muskwessu*, Ojibwa *miskwasi* ("it is red"), indicate, the Virginian name refers to the reddish color of the creature.

NIGHTINGALE.—Ojibwa *gaskaskanedji*, Nipissing *kaskaskanedjisi*, "the bird that warbles,"—an onomatopœic term.

OPOSSUM.—From the Algonquian dialects of the Maryland-Virginia region the words *aposon*, *opaasom*, *opossom*, etc., were early reported. The literal meaning of the name is indicated by Lenâpé *woapsu*, Ojibwa *wapisi*, Cree *wâpisiw*, "it is white," in reference to the color-marking of the animal.

OWL.—Cree *hohuw*, Ojibwa *kokoko*, Micmac *kookoogwes*, Lenâpé *gokhos*,—all imitative of the cry of the bird. In Cree a sort of white owl is called *wâbohuw*, "white owl"; another species, *amiskohuw*, "beaver owl." A sort of screech owl is known in Cree as *ottawokehuw*, "deaf owl," and in Ojibwa as *kakabisi*, with the same signification. Another species of owl is called in Ojibwa *peskwe*, "scar head."

PANTHER.—Cree *misipisiw*, Ojibwa *misipishi*, "big lynx." In Menomini the word for "panther" is *pishe* (or *pisheu*), identical with the term for lynx in Cree, Ojibwa, etc. Lenâpé *quenischquney* (*quenschukuney*), "long-tailed." See LYNX.

PARTRIDGE.—Cree *pihyew*, Ojibwa *bine* (*pine*). This term may be a general expression for "bird," localized in meaning to "partridge," as the words for "bird"—Cree *piyesis*, Ojibwa *bineshi* (*pineshi*), "little bird"; Ojibwa *binessi*, Nipissing *pineshinj* (or oftener *pineshinjish*), "little bird," *pinesi*, "a bird of large or average size"—indicate. According to Cuoq, an eagle is *pinesi*, a humming-bird *pineshinjish*. In Menomini *pinashi* (*pinashiu*) is the name of the bald eagle, while in Cree *piyesiw* signifies "thunder-bird" (a fabulous creature). Lenâpé *popokus*, partridge, signifies "knocker (drummer)," in reference to the "drumming" of this bird.

PERCH.—Ojibwa *osawa*, "it is yellow." In Ojibwa *oga* (Nipissing *oka*) means pickerel (the *poisson doré* of the French-Canadians), while Cree *okaw* signifies both pickerel and perch.

the animal's well-known habits. Abenaki *seganku* is a nasalized form of the same word.

SNAIL. — Ojibwa *bimiskodissi*, Nipissing *pimiskotisi*, "twisted (spiral) creature." Cree *akakwatjimin*, "snail," is identical with Ojibwa *sagaskwadjime*, "leech." In Cree "leech" is *akakkway*, while another Nipissing word for snail, *pimanakaskwesi*, seems to contain the term "twisted," and also the term corresponding to the Cree *akakkway*.

SNAKE. — Cree *kinebik*, Ojibwa *ginebig* (*kinepik*), Nipissing *kinebik*, "long (pointed) creature." In Ojibwa *mishikinebik*, corresponding to the Cree *misikinebik*, "big snake," is applied to a fabulous horned serpent. A large sort of serpent said to have been common in the Mackinaw region is called in Ojibwa *nadowe*, Nipissing *natowe*, perhaps "the searcher." In these two dialects this word signifies also "Iroquois," while in Cree the last meaning only attaches to it. From *natowe* are derived *Nottoway*, and (with the help of French) *Sioux* (truncated from a corrupt form of *nadowessi*). Another Algonquian term for snake is seen in the Lenâpé *achgook*, Narragansett *askug*, etc. Among other Lenâpé snake-words are: *machgeuachgook*, the copper snake, literally, "red snake"; *mehukachgook*, a species of copper snake, literally, "blood snake"; *mamalachgook*, "striped snake"; *mbiachgook*, "water snake"; *schawanachgook*, a so-called "horned snake," literally, "southern snake." See RATTLESNAKE.

SNIPE.—Ojibwa *padashkanji*, Nipissing *padjashkaanji*, "wrong clawed." Another Ojibwa and Nipissing name of the snipe is *manominikesi*, "the bird that eats wild-rice," which also means bobolink. Cree *sesesiw* signifies snipe, plover, woodcock. See PLOVER, WOODCOCK.

SPIDER. — Cree *otayapikkesis*, "little net-maker," cognate with Ojibwa *assabikeshi*, "net-making creature." Another Cree word is *pispiskuteweyik* (*pispiskwatewiyik*), probably "downy rectum."

SQUIRREL.—Ojibwa *atchitamo*, Nipissing *atshitamo*, "the animal that descends trees head downward." This is the same word as the *adjidaumo* ("tail-in-air") of Longfellow's "Hiawatha." The final syllable of *atchitamo* is often (nearly always, in fact) nasalized in Ojibwa, and from this word, with change of *t* to *p*, has come the *chipmunk* of American English,—this is proved by occurrence of the intermediary form *chitmonk*, in writers of the first half of the nineteenth century. The "chipping" of the animal has suggested a false etymology, as there can be no doubt of its Indian origin. Another Algonquian word for squirrel is seen in the Lenâpé *anikus*, "a mouse, ground-squirrel,"—of this word (written also *haniqus*) Rev. A. S. Anthony says that it signifies "any kind of squirrel," and its derivatives *kuweanik*, "red squirrel (literally, pine squirrel)," *wisawanik*, a species of red squirrel, literally, "yellow squirrel." The same word appears in Ojibwa *misanik*, Nipissing *misaniko*, "black squirrel" (literally, "big *anik*"), and probably also in Cree *anikwatchas*, "squirrel," *mistanikwatchas*, a species of large squirrel.

STURGEON.—Cree *namew*, Ojibwa *name*, Nipissing *name*, Micmac *numach*, Lenâpé *names*, signify "fish," which seems to indicate that a general term for fish in the region of the Great Lakes and the Northwest has been localized or specialized into the meaning "sturgeon," that fish being a characteristic one of that country. The derivation of the words for "sucker" and "trout" from the stem name strengthens this opinion. See SUCKER, TROUT.

SUCKER (CARP).—Cree *namepiy*, Ojibwa *namebin*, Nipissing *namebin*,—derived from *name*, "fish."

SUNFISH.—Menomini *ketakibihot*, Ottawa *ketakibihit*, "spotted (striped) one." This word is now obsolete.

SWALLOW.—Ojibwa *jashawanibisi*, Nipissing *shawanipinesi* (*shashawanipinesi*), "bird of the south," in reference to the autumnal migration and spring return of the bird.

TOAD.—Cree *mistayik*, "big frog." Cree *pipikwatettew*, "rough (warty) creature." Ojibwa and Nipissing *pupikomukaki*, "rough (warty) frog." See FROG.

TROUT.—Cree *namekus*, Ojibwa *namegos*, Nipissing *namekos*,—derivatives of *name*, "fish." Lenâpé *maschilamek*, "trout,"—the equivalent of the Nipissing *manzamedos*, "salmon-trout,"—signifies literally "like a fish." The *namaycush* of American English (and in the scientific *Salmo namaycush*) represents this Algonquian word for trout.

TURKEY.—Ojibwa *mississe*, Nipissing *misise*, "big bird." In Lenâpé, according to Rev. A. S. Anthony, "a turkey-cock is sometimes called *meteu*, from the drumming sound of his wings." An obsolete Lenâpé word for turkey-cock, *gulukochsün*, refers to "the upright position taken by the fowl."

TURKEY-BUZZARD.—Menomini *opashkoshi*, "the plucked (feathers removed) bird," in reference to the head of the bird. Ojibwa and Nipissing *winange* is derived from *win*, "dirt, filth," referring to the habits of the buzzard.

TURTLE.—The origin of Cree *miskinak* (*mikkinak*), Ojibwa *makinak* (*mikkinak*), Nipissing *mikinak*, is not clear. Ojibwa *jingademikwan* seems to mean "head spread out." Another Ojibwa word for turtle (the small species called in Canadian French *tortue barrée*) is *miskwadessi*, which, like the corresponding Nipissing *miskwatesi*, means "red creature." The species known as *tortue de prairie* is called in Ojibwa *bosikado*, Nipissing *posikato*, "hollow (deep)," in reference to the carapace which is employed to make spoons. A large species of tortoise or turtle is known in Ojibwa and Nipissing as *mishike* (from *mishi*, "big").

WEASEL.—Cree *sikkus*, Ojibwa *jingoss*, Nipissing *shingosi* are of uncertain etymology. Perhaps "disagreeable animal."

WHALE.—Cree *misikinosew*, "big fish." Ojibwa *misameg*, Nipissing *misamek*, "big fish." Another Ojibwa name is *kitchi gigo*, "big fish," while *kitchi manameg*, another term in the same dialect, signifies "big cat-fish."

WHIP-POOR-WILL.—Ojibwa and Nipissing *waonesi*, "the bird whose note is *waone*,"—an onomatopœic word, with *-si* "bird." Lenâpé *wekolis* is also imitative.

WHITEFISH.—Cree ***atikkamek***, Ojibwa ***atikameg***, Nipissing ***atikamek***, "caribou fish." Another Ojibwa name for a species of whitefish is ***otonabi***, "mouth water (or rather water mouth)," whence the "tulibee" ("tullibee") of Canadian English.

WOLF.—The etymology of Cree ***mahigan***, Ojibwa ***mahingan***, Nipissing ***maingan***, is uncertain,—perhaps, "tearer." Lenâpé ***wiechcheu*** signifies, according to Rev. A. S. Anthony, "hairy dung," from the character of the excrement.

WOODCHUCK.—Ojibwa and Nipissing ***akakwidjish*** is of uncertain etymology. The American English word "woodchuck" seems rather to be a corrupt form of *odjig* (*otchik*), the Ojibwa word for the "fisher," or pekan, than a derivative of the term for "woodchuck." Lenâpé ***monachgeu***, "digger," the ***moonack*** of American English, comes from the Maryland–Virginia equivalent of this word. It is possible also that the ***monax*** of Linnæus' scientific designation of this animal (*Arctomys monax*) is simply a Latinizing of the same term.

WOODCOCK.—Cree ***papakapittesis***, "little speckled creature." Ojibwa ***padjashkanji***, Nipissing ***padjashkaanji***, "wrong-clawed (?)." See SNIPE.

WOODPECKER.—Ojibwa and Nipissing ***meme*** seems imitative, —it is the name of a species of red-headed woodpecker. Ojibwa ***papasse***, Cree ***papastchew***, Lenâpé ***papachko***, may signify "splitter (cleaver)," like our "wood-pecker." Another Ojibwa word, ***pakweamo***, signifies "it breaks off a piece (of wood) with the mouth."

Another series of animal-names, those of creatures with which the Indians came into contact after the advent of the whites, deserves special consideration, and must be treated at another time. The present study may serve as the suggestion of a dictionary of Amerindian natural history from the standpoint of linguistic psychology.

ABORIGINAL COPPER MINES OF ISLE ROYALE, LAKE SUPERIOR

By WILLIAM H. HOLMES

INTRODUCTION

In the spring of 1892 the writer was engaged in gathering material for the anthropological exhibit of the Smithsonian Institution at the World's Columbian Exposition in Chicago. It was intended that a leading feature of the exhibit in the Archeological Section should be a display illustrating the ancient mining and quarrying[1] industries of the American aborigines, and in carrying out the plan visits were made to a number of important sites in the Middle West—to the flint quarries of Ohio, Arkansas, and Indian Territory; to the site of the quartz shops at Little Falls, Minnesota; to the pipestone quarries of Minnesota; and to the ancient copper mines of Isle Royale, in Lake Superior.

Although exhibits of the collections procured through these explorations were made in due course of time, full reports of the work done and the observations made at some of the points have never been published. Papers were prepared describing the flint quarries of Arkansas and Indian Territory, and the remarkable deposits of the rejectage of implement-making left upon the associated shop sites. A brief report was also published describing excavations made on the site of the ancient quartz shops at Little Falls.

In the vast area drained by the Great Lakes and the upper Mississippi lived and labored the native peoples encountered by the early French voyagers, and later by English and Americans.

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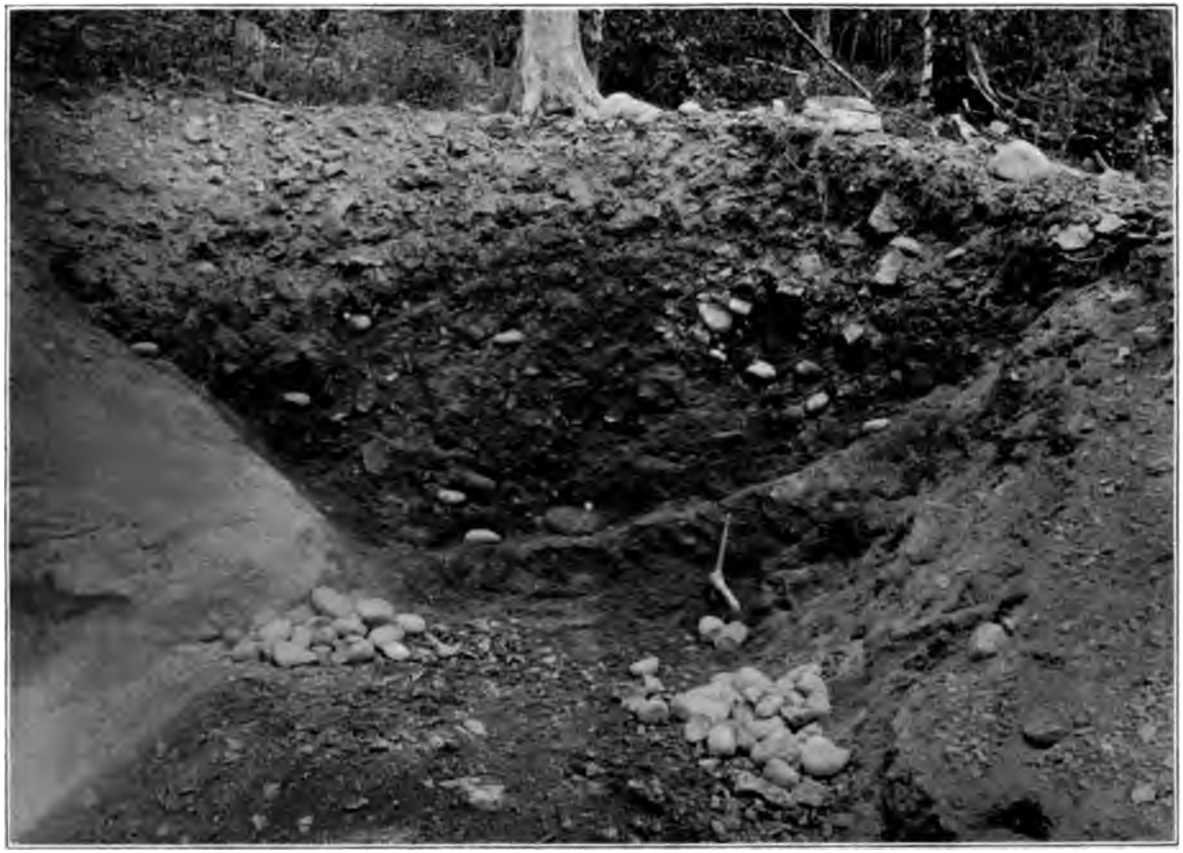
[1] The terms "mining" and "quarrying," as applied to aboriginal work, are practically synonymous.



EXCAVATION IN AN ANCIENT PIT SHOWING NUMEROUS STONE SLEDGES SCATTERED THROUGH THE FILLING

In gathering material for their stone implements these enterprising tribes discovered and sought to utilize lumps of a peculiar material, heavier and tougher than any stone with which they had been acquainted. Experiment showed that the ordinary processes by means of which stone was shaped were entirely incompetent to treat it. It could not be flaked, pecked, nor ground into shape, but in time the discovery was made that by hammering with stone sledges remarkable results could be achieved and valued ornaments and very superior implements could be shaped. These were the small masses of native copper, known as float copper, that had been torn from the massive trappean formations of the Lake Superior region by the ice-sheets and carried far down over the vast area now comprised in the states of Wisconsin, Michigan, Indiana, Illinois, and Iowa. The beginning of the use of copper by the native tribes of the Mississippi valley and the Great Lakes was due, in all probability, to the presence of these transported fragments, often folded, scratched, and rounded off, and in cases reduced, by the irresistible movements of the ice-sheet, to shapes that might be utilized to some extent as implements. We may surmise that, little by little, the aberrant fragments were traced northward to the region of their origin, where, instead of loose abraded lumps of metal, ragged masses were found fixed in the rock in place, and with the removal of these began the new and vastly important industry of copper mining in the Great Lakes region.

When the French pioneers came into the country, this work of freeing the copper bodies from the enclosing rock had gone on for a long time,—hundreds or many hundreds of years,—and really wonderful progress had been made in mining the copper, in transporting it to far-away districts, and in shaping it into implements, utensils, and ornaments.

VISIT TO ISLE ROYALE

Desiring to examine for myself the existing traces of a great native industry, I resolved to undertake a trip to Isle Royale, since there modern mining had not so completely destroyed traces of the ancient work as on the southern shores of Lake Superior, where extensive mining operations have been carried on for many years. A very good account of the old mines has been published by Prof. N. H. Winchell, who visited Isle Royale some twenty years ago; and other men of scientific attainments—especially mining engineers—have visited the island, giving the mines some attention, but maps and photographic illustrations are entirely wanting, and the collections of artifacts made have not found their way into the larger museums.

Availing myself of the generous hospitality of officers of the Booth Packing Company, at Duluth, I took the company's steamer at that point and, sailing by way of Port Arthur, Canada, landed at a little fishing station on the rocky northwest shore of the island. This was a mile north of the mouth of McCargoe's cove, a small bay or inlet extending two or three miles into the land in a southwesterly direction. It was at the head of this inlet that the mining company had located its shipping station, and the mines, now entirely deserted, lie still a mile or two to the south. Having taken with me from Duluth one laborer and a supply of provisions and tools, I obtained a second man and the necessary rowboat from fishermen at the station, and rowing into the little cove, found comfortable lodging in one of the deserted buildings of the mining company.

At the time of my visit there were no permanent inhabitants on this part of the island, the fishermen, who are concerned entirely with the waters of the open lake, living in improvised and temporary shelters along the shore. To all appearances no one had occupied the place for many years. When headquarters were established and our housekeeping arrangements in good shape, we set out by way of an old tramway line, now completely hidden by undergrowth, to find the site of the mines. The shallow valley up which we made our way is meandered by a small stream draining into McCargoe's cove. On the right a gentle slope rises to a low ridge, which, at most, is not more than three or four hundred feet in height, while on the left is a low, abrupt bluff, as indicated in the section (figure 73).

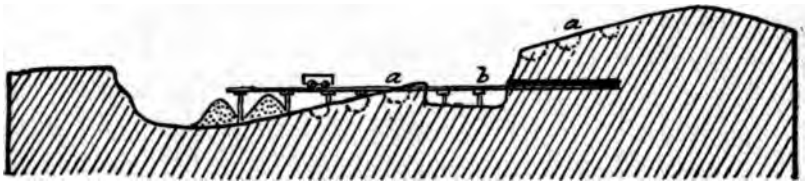


Fig. 73—General section of McCargoe's Cove copper mines. *a*, Slope of ridge with ancient pittings. *b*, Modern mines with tunnel, tramway, and dump.

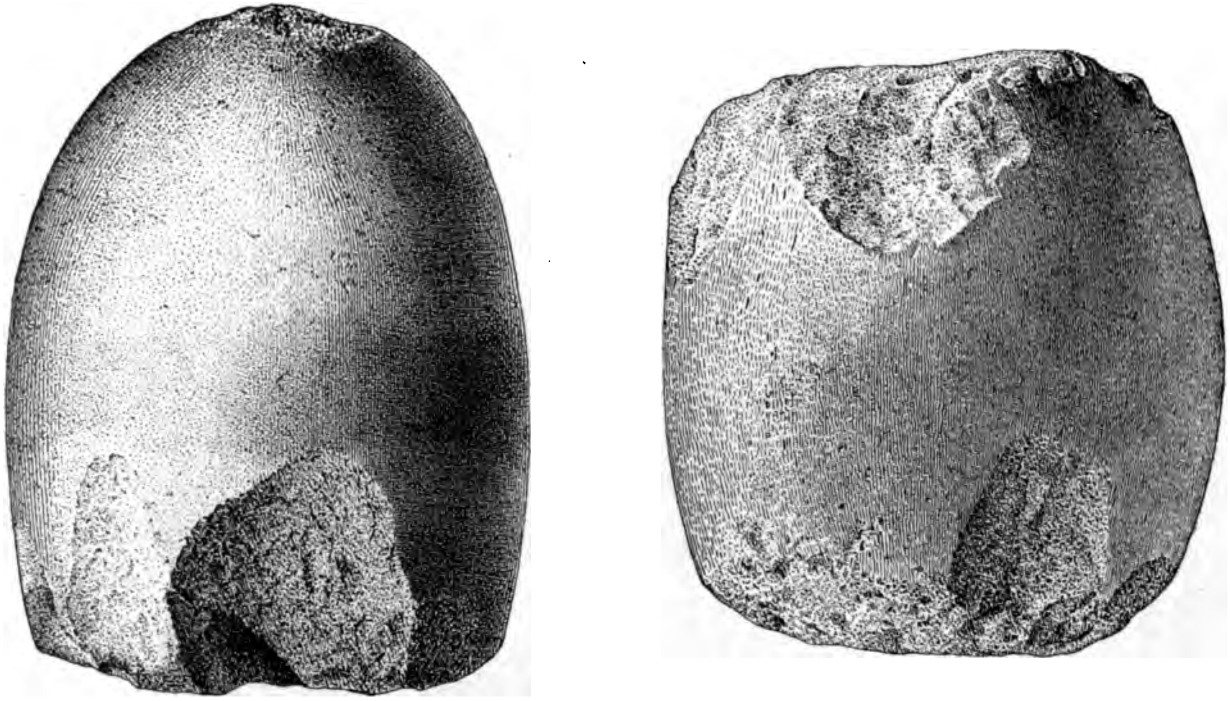
MODERN AND PREHISTORIC MINES

Approaching the mines we found ourselves passing the ends of lofty ridges of excavated material,—the dumps of the mining company,—and continuing in among these we encountered the remnants of workshops, engine houses, and elevated tramways, and on the right saw extensive excavations and the mouths of deserted tunnels penetrating the slope.

Topographically, this little valley and its bordering ridges are a part of a system of ridges and troughs extending, I believe, over a large portion of the island. The glacial ice-sheets pressed forward apparently along the strike of the strata, leaving the harder masses in bold relief, and, where the formations were less compact, excavating shallow valleys and depressions connecting one with another along the trend of the island, which is northeast and southwest. The deeper portions of these depressions are now occupied by ponds and swamps, and these with their alternating ridges, the fallen timber and dense undergrowth, make a country most difficult to traverse and wholly without scenic interest. Post-glacial drainage has not been active enough to modify the glacial sculpture, and the elevated portions present today the abraded and channeled surfaces left by the retreating ice. It was probably on some of these exposed masses of rock that the Indians first discovered the copper in place, since the ice, as it pared away the rock, caught the irregular masses of metal and tore them bit by bit from their firm anchorage, leaving half-detached fragments and ragged masses exposed. But the removal of these bits of metal was no easy task. They could not be broken off nor cut by any primitive device, and the only effective means of securing them was by crushing the enclosing rock with heavy sledges and shattering it by fire until the masses were freed. When the supply thus obtained was exhausted, the tedious work of uncovering the soil-hidden surface began, and the search was continued until a large part of the superficial formations of the little valley was worked over.

The overplaced deposits appear to consist largely of vegetal mold and other finely comminuted materials, but they have been so fully worked over by the ancient miners that their original character is not readily determined. In the valleys their extent is probably considerable, but at no point where excavations have been made is a thickness of more than a few feet exposed. In ascending the slope higher up we find that the overplaced deposits occupy only the depressions between the glaciated ribs of the hill.

The operations of our modern miners, although extensive, have by no means obliterated the ancient work. All over the slopes, above and between the recent excavations, are traces of the ancient diggings, and the extent of this work was a matter of great surprise to me. As in the flint quarries previously examined, I found myself wandering over the wilderness of pits and their accompanying mounds of excavated material, marveling at the enterprise and perseverance of the aborigines. For a people with only primitive tools, the work seems colossal. A long, narrow area amounting to at least half a mile square of the surface has been worked over, pit connecting with pit, the impression given being that hardly a square rod of ground within the particular area has been left unexplored. The pits are neither so deep nor so wide as those of the flint quarries, but



STONE SLEDGES USED IN BREAKING UP THE ROCK AND FREEING THE COPPER MASSES

they do not afford a good index of the work accomplished. The earlier pits were often filled up as the work advanced, and the crumbling debris has gradually been leveled by gravitation and the growth of forests.

From the surface indications it is difficult to say how far the ancient excavators penetrated the rock in place. It is apparent, however, that there was little tunneling. The rock was too massive and refractory, save where somewhat decomposed near the surface, to permit of successful manipulation by men having only stone tools. The work of the miner consisted in uncovering the rock surface with a view of discovering protruding masses of the metal, and these, when found, were removed by crushing the enclosing rock with sledges. The deeper and larger pits probably often mark the spots where important masses of the metal were found and removed, while the smaller openings are those resulting from general and, probably in many cases, bootless exploitation. It is said that in some of the old excavations bodies of copper were found by our own miners only partially liberated from the enclosing rock, while in other cases the masses encountered were so large that native devices were not equal to their removal. Indeed, some of the masses uncovered by the white miners defied for a long time the most advanced breaking-up and transporting contrivances of a civilized age.

The pit depressions are rounded or irregular in outline and seldom are more than three or four feet in depth. Numerous examples of the battered stone sledges are in sight. The plenitude of these sledges is everywhere apparent, and it was not unusual to see them turned up among the roots of the fallen forest trees. The battered, truncated ends of the originally symmetrical water-worn forms clearly tell the story of their use by ancient men.

A very good idea of the conditions under which the native quarrying work was carried on can be obtained by studying the margins of the modern excavations. These expose the entire thickness of the superficial and generally worked-over deposits, as well as much of the solid rock beneath.

EXCAVATIONS IN AN ANCIENT PIT

Wishing to examine the ancient pittings more in detail, I searched the walls of the modern mines for a favorable exposure in which to begin excavation, and finally selected a spot where the complete section of an ancient mine, some ten feet in depth and probably twenty feet in diameter, was exposed in a steep slope. The ancient pit was filled nearly to the top with well-compacted material, mainly crushed trap-rock and earth, the debris of excavation from this and neighboring pits. The most notable feature of these excavations was the ever-recurring sledge-hammers. Plate XXIII shows these implements projecting from the excavation face and clearly defined because of their light-colored smooth surface and entire unlikeness to the other material in the pit. The work of excavation continued until a large part of the contents of the mine was removed and complete vertical sections were exposed to view and photographed. In the plate upward of a dozen of the sledges are seen in place in the evenly-dressed front wall, and others already removed appear at the right and left in the bottom of the excavation. A silver dollar placed near the base of the front wall serves as a scale, as does also a pick resting on the bed-rock. It is seen that the rocky walls rise from the floor of the pit at an angle of about forty-five degrees, extending almost to the surface. How much of the excavated space was originally solid rock, removed by the ancient workmen, no one can say; but judging from the very large percentage of shattered trap found in the filling, and the multitude of sledges broken in the work, it is fair to assume that a considerable body of the rock in place was crushed and moved.

The discovery of considerable quantities of charcoal scattered through the mass indicates pretty clearly that fire was used to aid the sledge in breaking up the rock. I was not so fortunate as to encounter any copper nuggets or masses in this excavation. If such were found by the miners they were not too large to be disposed of, but there were many fragments of rock impregnated with the green oxide indicating the copper-bearing nature of the formation.

The question of the disposal of the larger masses of copper encountered was no doubt a very serious one with the native miners, and when they were too large to be carried away to the shops or to distant settlements, efforts were made to break them up. All protruding parts were belabored with hammers and if possible removed, as shown by the appearance of several masses deserted by the old miners because they were too large to be in any way utilized. They bore evidence of long-continued battering with sledges. Professor Winchell, who seems to have had excellent opportunities to observe the phenomena of the pits, remarks:

> "Some of the masses found, being too large for removal from the pits, show the marks of long-continued pounding, and about them in the pits are a great many small, thin chips of metallic copper, of irregular shapes, with concavo-convex surfaces exactly such as would be produced by battering a small nugget of copper to a thin layer by pounding it continuously on the same side. The finding of these thin chips of copper is the first indication to the present miners of the proximity of a large mass. In the summer of 1874, the first of these large masses was discovered. It was sixteen and one half feet below the surface, and under it were poles, as if it had been entirely detached, but it had not been much displaced. This mass was exhibited publicly in the yard of the Court-house at Detroit, and was also on exhibition at the Centennial Exposition in 1876. It was subsequently fused and sold as commercial copper. It weighed 5720 pounds, and has been described by Mr Henry Gillman in the annual volume of the American Association for the Advancement of Science for 1875. In the summer of 1879, two other large masses that had been wrought by the ancients were found at the Minong mine, which is at the head of McCargoe's cove. One had a weight of 3317 pounds, and the other 4175 pounds, the latter being about nine feet long. The largest mass yet

found at that place was taken out the previous summer, weighing six tons; but the ancients had not discovered it, though one of their drifts ran within two feet of it. The large masses discovered by the ancients show the labor that has been spent on them in their hammer-marked and pitted surfaces. They seem to have been beaten up into ridges and points, by hammering alone, for the easier removal of parts. One of those found in 1879 was not detached from the enclosing rock, though it was wholly uncovered and undermined."

STONE IMPLEMENTS

Perhaps the most constantly present and remarkable feature of these sites is the stone quarrying sledges, varying from three to twelve inches in length and from an inch to eight inches in diameter, a few specimens reaching a weight of perhaps sixty pounds. They occur in countless numbers upon the surface and in and about the pits, proclaiming the aboriginal character of the work. The bruised and shattered remnants of these sledges literally fill the ancient mining debris, as already shown, and in sections of the deposits made by recent mining operations they are seen protruding at all points, being rendered distinctly visible by their smooth surfaces and general bluish or light-gray colors contrasting with the dark earth. In places cascades of sledge-charged refuse descend into the recent mines, as shown in some of the views taken. Upward of twenty specimens had fallen into a little heap of gravel from an ancient pit at the top of the wall in front of the entrance to one of the modern mines.

The presence of multitudes of stone sledges in and about the mines tells a clear story of the character of the aboriginal work. Wooden implements would have served to loosen and remove the superficial materials, laying bare the rock surfaces and exposing protruding masses of copper, but the globular bowlder-sledge could have served no purpose in the work save that of breaking up the enclosing rock and freeing the lumps of metal. Although these sledges are natural bowlders rarely modified by art, they are by no means rude affairs, or mean makeshifts. They are as perfectly adapted to the rock-crushing work as if shaped for the purpose. Doubtless they were carefully selected, and it is believed that they were brought from the beach several miles away, or, more likely, from deposits of water-polished bowlders along the northern shore of the lake. Professor Winchell says:

> "They were certainly gathered as pebbles along the shore of the lake, north from the island, where there are still others of the same shapes and sizes, and of the same varieties of rock, formed on the beach by the action of the waves. The great profusion in which they are scattered among the debris of the pits would itself indicate the ease with which they were obtained. . . . The rock of which they are composed does not occur as pebbles on Isle Royale, and indeed it is doubtful if it exists at all on the island. It forms the coast of the mainland for several miles opposite the island. It is an igneous rock, usually a diabase, as shown in thin sections under the microscope, consting essentially of a triclinic feldspar and augite, with magnetite.is Sometimes the grains are coarser, and the rock would more properly be styled a diorite or a gabbro. They belong to the formation designated by Sir William Logan *The Lower Volcanic Group*, but since styled *Animikie Group* by Prof. T. S. Hunt. Occasionally, however, the workmen seem to have gathered rounded stones of other varieties of rock, though nothing equaling the firmness of the above, and so fit for the purpose of a rude hammer in simple mining, can be selected among all the rocks of the region. One or two, of a granite containing red orthoclase, were seen at the mine, and a few of other granites are reported to have been found. These other varieties are also seen mingled sparsely with the diabase stones along the Canadian shore, and are referable to the drift forces which transported them from farther north and east in Canadian territory."

If the theory that the bowlders used in the mines came from the northern shore of the lake, ten or fifteen miles by water and perhaps two miles by land, is well founded, the question of transportation must have been a very serious one for a savage people. The number of pieces packed in from McCargoe's cove, perhaps on the backs of women, was very great, and may be estimated not by thousands but by hundreds of thousands. If the worked-over ground is as much as half a mile square and averages one yard in depth, we have upward of seven hundred thousand square yards of implement-bearing material. An examination of the exposed pit-sections often shows as many as two or three sledges to the square yard, and this would give perhaps four times that many to the cubic yard, or some three million for the mines as a whole. A million does not, therefore, seem an excessive estimate. There are tens of thousands in sight upon the surface. Allowing three pounds each for these bowlders, the material transported would amount to upward of a thousand tons.

It has been stated by a number of authors that the stone sledges were probably used in the hand without hafting. This view is due to the fact that on Isle Royale very few specimens are grooved, while on the southern side of the lake grooving is the rule. It would seem, however, that these stones held in one or even in both hands would make very ineffective tools with which to crush the solid masses of living rock. I conceive it to be quite possible to successfully withe-haft without grooving, and the fact that in many cases there is a polished band around the implement at the point where the withe would encircle it, seems to warrant the conclusion that hafting was common. It would look like a waste of energy to undertake the tedious task of pecking a groove in these bowlders when the first blow struck in the quarry work might shatter the implement, making it entirely useless. We observe that the bowlders chosen were generally ovoid in shape and often with the sides approximately parallel, so that withe-hafting would be easy. Two typical examples are shown in plate XXIV, the upper specimen being much battered at one end and the other at both ends. A polished band extends around the middle of the implement.

Among the stone implements found are a few forms that may properly be classed with the flaking hammers of the flint quarries. All are small and somewhat discoidal, and are flaked and battered more or less completely all around the periphery. They could have been used in grooving sledges and in shaping or repairing other stone tools.

COPPER AND WOODEN IMPLEMENTS

Professor Winchell mentions the finding of several forms of copper tools, including a gad or bodkin, a chisel, knives, and arrowheads. He states that Captain Jacka discovered a wooden shovel or paddle which was battered on the edges as if from use in moving dirt. It is not improbable that a canoe paddle may have been devoted to this work, the form being well suited for the purpose.

DISPOSAL OF THE PRODUCT

The question of the utilization of the quarry product is a very interesting one. I was extremely anxious to discover traces of the workshops of the ancient miners and smiths, but the sites likely to have been occupied were buried in a dense growth of grass, weeds, and underbrush, and nothing could be seen. It is unlikely, however, that any considerable amount of the shaping work was conducted on the island. It seems to me more likely that the pieces of metal obtained were carried away to distant centers of population to be worked up by skilled local artisans, and we may fairly assume that a considerable trade existed in the raw material. A knotted rawhide string also was found, preserved possibly by contact with copper oxide. The articles mentioned are just such as would be used and lost or abandoned by aboriginal workmen, and serve to connect the known tribes of the lake region with the working of these mines.

MINES OF THE ONTONAGON DISTRICT

Subsequently to my visit to the Isle Royale mines I have had the opportunity of seeing something of the ancient work on the southern side of Lake Superior. At Rockland, near Ontonagon, where a vast amount of modern mining has been done, I found the aboriginal evidences quite plentiful, and apparently identical in character with those of the more northern district. The sledges differ in being more frequently grooved, but this need not be attributed to the usages of a different people, but to the fact that the shapes of the available stones were not well adapted to hafting and had to be more or less completely remodeled to make them available; besides, the material is less brittle, making them better worth the trouble of groove-hafting. The area worked over by the ancient miners is very great, a series of sites extending all along the Copper range, and it is said by those most observant of the ancient traces that hardly a site that has yielded native copper to the modern miner was missed by the aboriginal workmen. Here, as in many other parts of the country, the remarkable enterprise and acumen of the natives are made apparent, as nothing in the way of available resources seems to have escaped them. It was in this region, no doubt, that most of the copper distributed over the Mississippi valley and the Atlantic slope originated, and here we are in the midst of the district in which copper implements are found today in greatest plenty.

ON THE AGE OF MAYA RUINS

By CHARLES P. BOWDITCH

The inscription lately discovered in Chichen Itza by Edward H. Thompson, United States Consul at Merida, is of more than passing interest. It contains an Initial Series of glyphs, which, so far as I know, gives the only initial date that has been found in the northern part of Yucatan.

Although it may be a matter of doubt on what date the long count delcared by the Initial Series began, yet, if we assume that the majority of the initial dates refer to the time when the buildings or stelæ on which the dates occur were erected (and this assumption seems altogether probable), we can at least decide on the relative age of the ruined cities in which the buildings or stelæ are found.

The great cycle glyph in the Chichen Itza date is somewhat injured, but it is apparently of the same character as those found elsewhere. The numbers of the cycle, katun, tun, and uinal periods are 10, 2, 9, and 1, respectively. The number of the kin period is a face which, from the circle of dots around the mouth, is pretty surely 9. The day number is 9 and the month number is 7. The day glyph is somewhat obscure, but contains a circular frame supported by a knot, while the month glyph is pretty surely Zac. We can then be sure of the following: ?. 10. 2. 9. 1. ?, 9. ?. 7. ?., with the probability that the second ? should be replaced by 9 and the last? should be replaced by Zac. Assuming for the moment that the great cycle sign is what Goodman calls 54, we find from the tables that 54. 10. 2. 9. 0. 0. is 6 Ahau 18 Chen- (49), and that 54. 10. 2. 9. 1. 0. is 13 Ahau 18 Yax (49). Now, in order to reach a day with the number

9 and a month day with the number 7 from 13 Ahau 18 Yax, we must add 9 days. This makes the date necessarily 54. 10. 2. 9. 1. 9., 9 Muluc 7 Zac (49). The day sign, though rubbed, has the characteristics of Muluc, and the month is shown to be surely Zac; the kin number is also proved to be 9.

There is just a possibility that the great cycle may not be 54. If it is 53, the date must be 9 Muluc 12 Muan; if it is 55, the date must be 9 Muluc 2 Yaxkin; but the month number is clearly 7, which eliminates both these great cycle numbers. In order to find a great cycle with the numbers ?. 10. 2. 9. 1. 9, 9 ?. 7. ?, we should have to go back or forward from Great Cycle 54 at least five great cycles, which means over 25,000 years. This is such an enormous distance that it can practically be thrown out of consideration, and we may be well satisfied that the great cycle is really the same period in which almost every one of the other dates occurs, viz., 54.

It will be interesting to compare this date with the first and last known dates of the other ruined cities of Chiapas and Guatemala. I give a list of these dates:

	Earliest	Latest	Period of Existence
Piedras Negras	54.9. 8.10.6.16.	54.9.12. 2. 0.16.	3.11.12. 0.
Copan	54.9. 6.10.0. 0.[1]	54.9.16.10. 0. 0.	10. 0. 0. 0.
Quirigua	54.9.14.13.4.17.[2]	54.9.19.13. 0.12.	4.19.13.15.
Yaxchilan	54.9. 0.19.2. 4.[3]		
Palenque	54.9. 4. 0.0. 0.[4]	54.9. 8. 9.13. 0.	4. 9.13. 0.

The above collation establishes the fact that Piedras Negras,

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[1] The date of Stela D given by Goodman as 54. 9. 5. 5. 0. 0. is almost surely 54. 9. 15. 5. 0. 0.

[2] The dates 54. 13. 0. 0. 0. 0. and 54. 9. 1. 0. 0. 0. may well be traditional and not historical, and refer to a period lying far in the past.

[3] This date on Lintel 22 is very clear, but as it is the only one which I have seen, I omit it in the following discussion. If historical, it is earlier than the earliest date of Quirigua except that of the normal date 54. 13. 0. 0. 0. 0., 4 Ahau 8 Cumhu.

[4] The dates of the Temple of the Cross, Temple of the Sun, and Temple of the Foliated Cross are almost surely traditional. The dates on the Palace Steps, given by Goodman as 55. 3. 18. 12. 15. 12., should undoubtedly be 54. 9. 8. 9. 13. 0.

Copan, Palenque, and Quirigua flourished contemporaneously for at least a part of their existence, for the last known date of Palenque is but 0. 11. 16, or less than one year before the first known date of Piedras Negras. This does not necessarily mean that Palenque was deserted at the establishment of Piedras Negras. Of course as investigation proceeds other inscriptions may be discovered which may give earlier or later dates, but it is interesting to note the relation between the known dates of all these cities.

The date of Chichen Itza is later than any of the dates found above. The following list shows the distance from the earliest and latest dates of the ruined cities of Chiapas and Guatemala to the date recently found in Chichen Itza.

DISTANCE OF THE EARLIEST AND LATEST DATES TO THE DATE OF CHICHEN ITZA

	Earliest	Latest
Piedras Negras	13.18.12.13, 274 y. 323 d.	10. 7.0.13, 204 y. 73 d.
Copan	15.19. 1. 9, 314 y. 259 d.	5.19.1. 9, 117 y. 164 d.
Quirigua	7.15.14.12, 153 y. 247 d.	2.16.0.17, 55 y. 102 d.
Palenque	18. 9. 1. 9, 364 y. 9 d.	13.19.6. 9, 275 y. 194 d.

The Book of Chilan Balam of Mani[1] states that on Katun 13 the people whose history is recorded in this book reached Chacnouitan eighty years after leaving Nonaual, and that on Katun 6 of the following cycle Chichen Itza was discovered, and that on Katun 11 of the second following cycle they removed to Chichen Itza, having remained at Chacnouitan ninety-nine years. The distance from Katun 13 of one cycle to Katun 6 of another is 200 tuns, or about 197 years. The distance from Katun 13 of one cycle to Katun 11 of the second following cycle is 280 tuns or about 276 years.

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[1] *The Maya Chronicles*, D. G. Brinton, Phil'a, 1882, p. 87.

First date of Piedras Negras,	54.9.8.10.6.16	3.11.12. 0.=70 y. 250 d.	13.18.12.13= 274 y. 323 d.
Last date of Piedras Negras,	54.9.12.2.0.16		
First date of Quirigua,	54.9.14.13.4.17	4.19.13.15=98 y. 145 d.	
Last date of Quirigua,	54.9.19.13.0.12		
Chichen Itza,	54.10.2.9.1.9	2.16.0.17=55 y. 102 d.	

The coincidences of dates are remarkable when it is seen that the length of time from the first date of Piedras Negras to that of Chichen Itza is 278⅗ tuns, while the time between the arrival at Chacnouitan to the removal to Chichen Itza is given by the Book of Chilan Balam as 280 tuns. More than this, if an inscription should be found hereafter in Piedras Negras recording a date as late as 54. 9. 13. 9. 6. 16, this would show a stay in Piedras Negras of 99 tuns, the time given in the manuscript for the stay at Chacnouitan, and if about 54. 9. 13. 9. 6. 16, the people of Piedras Negras deserted that city, they would have passed 204 years and 73 days before arriving at Chichen Itza. Now, all the historical dates of Quirigua lie between this last date and that of their arrival at Chichen Itza. Could the people of Piedras Negras have passed over to Quirigua and occupied that city during a part of this period of 204 years ?[1]

Such speculations may not be of great value, but if they excite enough interest to induce a more thorough investigation, they will not be absolutely useless.

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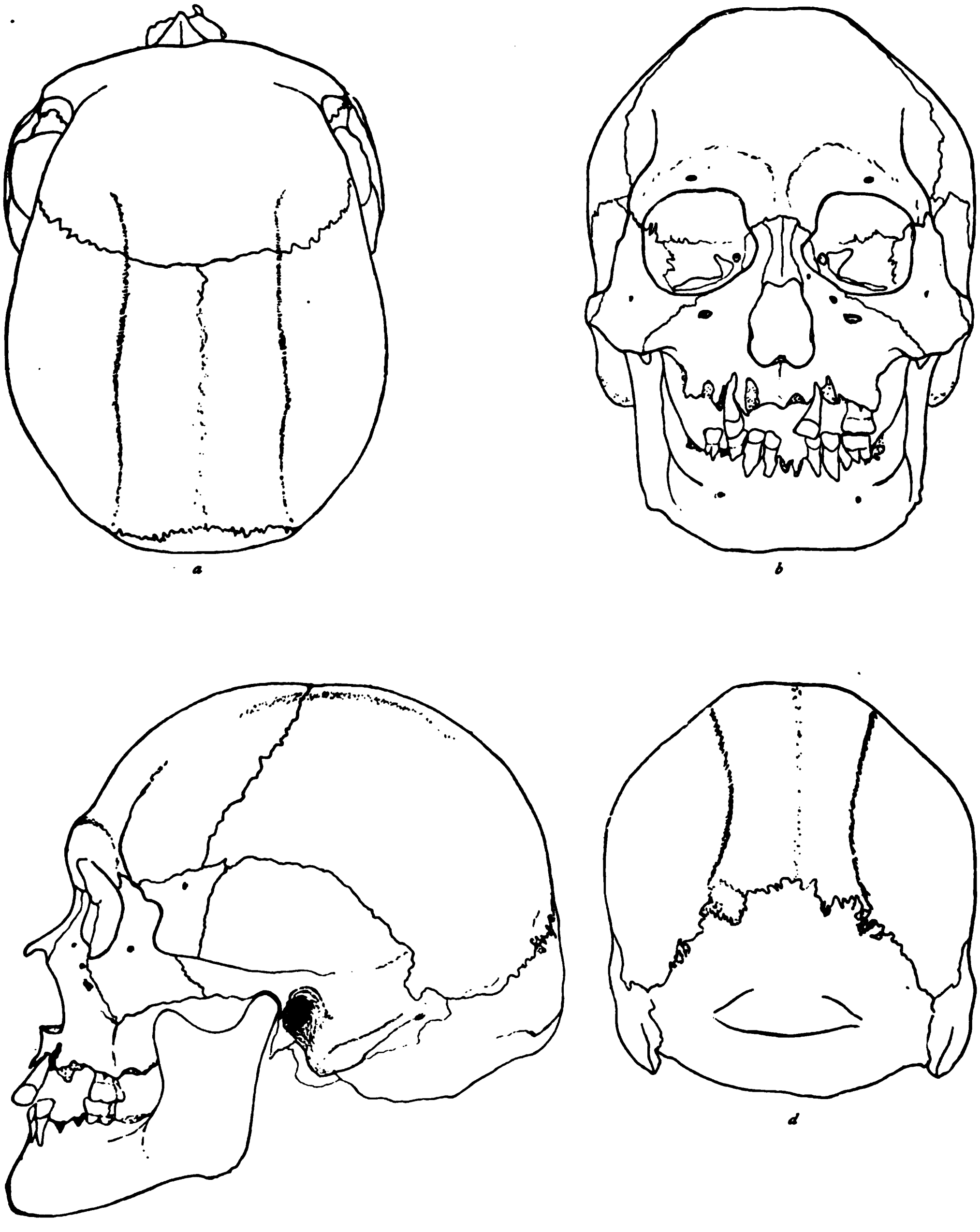
[1] If, however, we accept the date of 54. 9. 1. 0. 0. 0. in Quirigua as historical, as I was inclined to think when I wrote "Memoranda on the Maya Calendars used in the Books of Chilan Balam," the foundation of Quirigua would be anterior to all the dates which I have used in the above calculations.



THE TALAYOTE SKULL

a, Anterior view ; *b*, Superior view ; *c*, Lateral view ; *d*, Posterior view. (A. M. N. H., No. 99–45.)

A PAINTED SKELETON FROM NORTHERN MEXICO, WITH NOTES ON BONE PAINTING AMONG THE AMERICAN ABORIGINES[1]

By ALEŠ HRDLIČKA

In 1899 I described an ancient skeleton from the valley of Mexico[2] which was particularly remarkable for its many inferior characters and anomalies. In my further examinations of the osteological material in the anthropological collections of the American Museum of Natural History, I came across another Mexican skeleton which exhibits a sufficient number of points of interest, partly of somatological and partly of ethnological character, to deserve special description.

This skeleton, as the one described before, was obtained by Dr Carl Lumholtz near Talayote, a rancheria in the most southerly part of the state of Chihuahua. It was found buried, with the head toward the west, about half a meter deep in the dark soil of a mesa near the above-named place. The region of Talayote lies in the Sierra Madre at over 7500 feet elevation; it has rather a dry climate, with a wet season of not long duration, and is and long has been occupied by the Tepehuane tribe of Indians. The field in which the skeleton was found, according to indigenes, has been used at times for a burial ground. Nothing of scientific interest was discovered immediately with the skeleton, and further search of the field could not be conducted owing to opposition on the part of the natives.

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[1] Published with the permission of the Trustees of the American Museum of Natural History, New York City.

[2] "Description of an Ancient Anomalous Skeleton from the Valley of Mexico; with Special Reference to Supernumerary and Bicipital Ribs in Man," *Bulletin* of the American Museum of Natural History, XII, art. V, pp. 81–107; also, translated by A. Herrera, in the *Anales* of the Museo Nacional, VII, p. 75 *et seq.*

The skeleton (No. 99-45 A. M. N. H.) consists of a complete skull and lower jaw, both clavicles, twelve (mostly incomplete) ribs, a portion of the right scapula, parts of six dorsal vertebræ and one complete lumbar vertebra, the sacrum, both coxal bones, the long-bones of the right arm and forearm and those of both lower extremities, the right calcaneum, one patella, two tarsal bones, and five metatarsals and phalanges from the feet.

All the bones are apparently very largely, if not entirely, devoid of animal matter, while the enamel of the teeth is chalky. Such a condition of bones and teeth would, if these were found in a sandy soil in a similarly dry region, indicate a very old burial; but as the skeleton was found in agricultural soil, in which decay of organic matter is more rapid, the burial in all probability is not very ancient. Still, a correct estimate in this matter, unless all local conditions are very well known, is impossible.

Almost all the bones of the skeleton show patches, in some instances (as in the tibiæ and femora) very extensive, of superficial effects of burning, but in no place are the bones charred. It is very probable that the burning had been employed for the purpose of destroying the soft parts, or their remainders, adhering to the bones.

The deficiencies of the dorsal vertebræ are of peculiar character, which fact is probably also of some ethnological significance. Each one of the bones is divided through the pedicles, and the bodies are all absent. The breaks correspond fairly well in place and character, and suggest an artificial opening of the spinal canal. It is possible that these breaks are in connection with an artificial enlargement of the foramen magnum in the skull, and that their purpose was the extraction from its cavities of the nervous matter.

In addition to those mentioned, most of the bones of the skeleton, and particularly the ribs and vertebræ, show red coloring, both externally and in their interstices. The skull shows numerous patches of the coloring, particularly on the facial parts; it is free from it on its ventral or endocranial surface and in a large portion of the nasal cavity. Of the long bones of the lower limbs distinct remnants of staining are found only on the right femur, but the pigment is very plain on the bones of the tarsus.

The coloring is due, as I ascertained with the aid of Dr Bookman, Associate in Chemistry in the Pathological Institute of the New York State Hospitals, to an amorphous pigment of organic nature, allied in color to cochineal, and entirely insoluble in water. It is plain that the staining is not accidental. The pigment was either applied to the surface of the bones as paint and subsequently penetrated into their various crevices, or was buried with the bones and subsequently spread over and into them. Judging from the aspect of the surface of the bones, particularly that of the scapula and vertebræ as well as parts of the skull, the former of these views is the much more probable.

The femora and tibiæ show signs of scraping, but the scraped surfaces look rather fresh. Closely adhering to the internal surface of the left tibia is a piece of fabric, similar in appearance to the coarse, brown, sack-like cloth, remnants of which are not infrequently found with skeletons in northern Mexico. Apparently the bones had been wrapped in such a fabric.

The absence of the whole left arm and the left scapula is peculiar.

DESCRIPTION OF THE SKELETON

The bones under consideration are those of a male in somewhat advanced adult life. Calculating from Manouvrier's tables, on the basis of the long bones, the man was about 1.64 m. in height. None of the parts of the skeleton shows any disease or deformation; the right femur, however, presents traces of an ancient, well-repaired fracture of its shaft.

The skull is very small; its capacity, measured by Flower's method, amounts to only 1300 c.c., which, if we follow Flower's classification, ranges it among microcephalic crania (microcephals below 1350 c.c.). The only smaller Mexican male skull I have thus far seen was the San Simon specimen described in the publication previously mentioned; this particular cranium measured, by Flower's method, only 1225 c.c. The Talayote skull is further remarkable by reason of its highly situated and very prominent temporal crests, which give the calvarium a marked pentagonal form.

DETAILED NOTES

The *supraorbital ridges* are very pronounced and prolonged from the glabella to the malo-frontal articulation. The glabella itself is somewhat less prominent, and as a result of this the ridges are separated by quite a marked median depression.

The *forehead* of the skull is narrow and sloping, and the whole frontal bone is of extraordinarily small proportions, as will be seen from the following measurements:

Diameter frontal minimum.......8.6 cm.
Diameter frontal maximum......11.0 cm.
Arc of nasion-bregma...........12.3 cm., of which the nasion-ophryon is 2.5 cm.

Where there is not much lateral bulging of the frontal bone, the degree of the sloping of the forehead is indicated quite well by the difference between the length of the two arcs passing from the auditory meati over the forehead—one at its middle and one over the most prominent part of the frontal eminences. The difference between these two arcs varies among the Mexican Indians from 1.0 to 1.8 cm. in favor of the latter. Only very seldom is the difference smaller than 1 cm. In this case it is 0.5 cm. only.

Immediately above the very small frontal eminences the forehead rises on each side of the median line to a prominent dull elevation. These elevations or crests are located immediately above and run along the impressions of the temporal muscles and fascia. They run nearly parallel, about 4.0 cm. distant, and inclose a slight depression in their middle; they are continuous from the middle of the forehead to beyond the vertex, becoming gradually lower and less distinct, until at the level of the obelion they disappear. These crests give the frontal bone a pentangular shape, with the base of the figure reposing on the orbits. The formation is one of a very primitive order, and in an equally pronounced form is exceedingly rare among American crania. The only other specimen of this nature that came under my observation is a microcephalic skull from a mound on Detroit river, Michigan. This specimen is preserved in the Peabody Museum, Cambridge, and was briefly reported in 1873[1] by Jeffries Wyman, who considered the crests in that skull (and I am of similar opinion in regard to the specimen that is being described) as of an inferior character, due to "an extreme case of individual variation from the ordinary form."

The *temporal regions* are quite flat and narrow; the biauricular diameter (vertically above the external meati and above the roots of the zygomæ) is 12.2 cm. The *parietal bosses* are rather prominent (diameter between their centers, 12.8 cm.).

Occipital region.—The space over the lambda is flat. The inion region and the neighboring parts of the bone beneath the highest curved line are bulging and rough. The superior curved line of the occipital squama is quite plain, but there is no well-formed occipital crest. Below the inion region the bone is flat for about 3.0 cm., and then presents a marked bilateral, cerebellar bulging separated by a median digital depression.

The *mastoids* are of medium masculine size, and are bounded on each side above and dorsally by a marked zygomatic ridge.

The *base of the skull* shows a decidedly inferior development. The middle lacerated foramina are small; the petrous portions of the temporal bone are on a level with the surrounding parts; the styloids are diminutive.[2]

The spinous process is double on each side, the second part rising from the petrous portion. The vaginal processes are unusually high and apparently compensate for the defect of the styloids. The glenoid fossa is of but moderate depth.

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[1] *Sixth Annual Report* of the Peabody Museum, pp. 12, 13.

[2] On the significance of these characters see *Science*, Feb. 22, 1901, p. 309.

The opening of the *foramen magnum* is enlarged on the left side, the border and some neighboring parts of the bone being broken off.

The *cranial sutures* are very simple. Obliteration is quite advanced, involving the whole sagittal suture, and spots in both the lambdoid and the coronal sutures. (The nasal sutures are patent except the lower end of the internasal.)

The *pterions* form both a narrow H (1.0 cm.).

There are but two small *intercalated bones* in the cranial sutures, one in the left portion of the lambdoid and the other in the right spheno-parietal suture. (In addition there is a moderately large irregular Wormian bone in the right spheno-malar suture.)

The parietal foramina, one on each side, are of ordinary size.

The *facial parts* are of moderate prominence. The face as a whole is relatively narrow.

The outline of the *orbits* is very irregular; the orbital edges are of medium dullness. The supraorbital wall encloses on each side a supraorbital foramen; these foramina are situated farther outward than usual (the right 3.1 cm., the left 3.0 cm. from the center of the glabella).

The *nasion depression* is of moderate depth; the nasal bridge is somewhat low and narrow, concave in its upper third and straight in the remainder. The nasal aperture is rather narrow; the nasal spine is of medium strength and height, though quite short. The nasal border is sharp. There is on each side a moderate subnasal fossa.

The *malars* are of medium strength and prominence. Across the middle of each bone runs a marked antero-posterior ridge. The marginal processes are very pronounced. The zygomæ are broad and strong.

The suborbital ("canine") fossa is shallow on the left, moderately deep on the right side. There is a smaller supplementary infraorbital foramen on the left, and on each side can be seen a suture passing from the infraorbital foramen to the orbital border.

The upper dental arch is somewhat irregular, due to old losses of teeth; and rather low, due to advancing absorption. Due to this absorption alveolar prognathism, apparently pronounced before, has become less noticeable. The lower alveolar arch is in every respect normal.

Teeth.—The dentition has been complete (thirty-two). A number of the teeth were lost during life, and two of those remaining show signs of decay. The teeth are of medium size and of normal form; length of right upper canine, 2.6 cm. The upper front teeth were apparently somewhat irregularly set, and the roots of the middle incisors were short. The enamel of the teeth, as above mentioned, is chalky. The crowns of the molars show moderate wear.

The *palate* is ovoid in shape, quite shallow, broad posteriorly and short. Length (alveolar point to line connecting the posterior ends of the alveolar arch), 4.9 cm.; breadth maximum externally, immediately above the molars, 6.6 cm.; palatal index, = 134.7 hyper-brachyuranic. Height opposite first molars, 1.0 cm.

The *posterior nares* are broadest inferiorly, near the palate; the openings measure each 3.0 cm. in maximum height (to the sphenoidal border) and 3.0 cm. in maximum breadth (together).

The *lower jaw* is of medium strength and normal form. The chin is quite protruding; the angle between the plane of the horizontal rami and the line from the protuberance of the chin to the median point of the lower alveolar process, is about 60°. Angles between the horizontal and vertical rami, 116°. The angles are but moderately developed. The coronoid and condyloid processes are of nearly equal height.

Measurements:

Diameter bigonial	9.8	cm.
Length of horizontal ramus (mean)	9.6	"
Height of vertical ramus	6.0	"
Breadth of vertical ramus at middle	3.3	"
Anterior height of the jaw (less the teeth)	3.2	"
Depth of sigmoid notch (mean)	1.15	"
Thickness opposite second molar	1.85	"

The facial and palatine sutures present nothing unusual.

CRANIAL MEASUREMENTS

The breadth-length index of the cranium is **72.8**, the diameter antero-posterior being 18.0 cm. and the diameter lateral maximum 13.1 cm. This index places this skull in the great group of dolichocephals of upper Mexico, and is near that of four other Tepehuane as well as that of the Tarahumare crania in the American Museum collection.

The height of the skull (basion-bregma) is 13.2 cm., which gives the height-length index of **73.3**, and the height-breadth index of **100.8**. The skull is metriocephalic (Turner) and in that respect is also similar to other north Mexican dolichocephalic crania.

The *face*, as mentioned before, is relatively high and narrow. The menton-ophryon diameter measures 14.3 cm., the alveolar-point-nasion diameter about 7.1 cm., the maximum bizygomatic diameter 13.0 cm.; this gives the low general facial index of **91.5**, and the upper facial index (Kollman) of **54.6**.

The external orbital diameter is 10.2 cm., the bijugal diameter 11.7 cm.

The face as a whole is orthognathous; basion-nasion diameter 9.7 cm., basion-alveon diameter about 9.1 cm., gnathic index (Flower) about **94**. The index of alveolar prognathism is about **114**, which is not excessive for an Indian cranium.

The *orbits*, in the mean, are 4.2 cm. deep, 3.8 cm. broad, and 3.6 cm. high. Their index, **94.7**, considering the pronounced supraorbital ridges, is very high. The mean orbital index of three other male Tepehuane crania in the Museum ranges from 87.5 to 94.1. The interorbital distance is 2.4 cm.

The *nose* is leptorrhinic; height 5.3 cm., maximum breadth of aperture 2.4 cm., nasal index 45.3. In four other male Tepehuane crania this index ranges from 45.3 to 56.2.

Additional measurements:

Rays:	Basion-menton	10.6 cm.
	Basion-ophryon	11.2 "
	Basion-bregma	13.2 "
	Basion-maximum	13.6 "
	Basion-lambda	10.7 "
	Basion-inion	8.8 "
Arcs:	Middle of external meati, over middle of forehead,	29.0 cm.
	Middle of external meati, over frontal eminences	29.5 "
	Middle of external meati, over bregma	30.8 "
	Middle of external meati, over maximum	32.3 "
	Middle of external meati, over lambda	28.6 "
	Middle of external meati, over inion	25.9 "
	Nasion-bregma	12.3 (34.2 %)
	Bregma-lambda	12.3 (34.2 %)
	Lambda-opisthion	11.4 (31.7 %)
	Circumference maximum (above ridges)	50.0 cm.

VERTEBRAL COLUMN

Portions of six dorsal and one complete lumbar vertebræ are present. The size of all these bones is moderate and the form ordinary.

Measurements of the lumbar vertebra:

Antero-posterior diameter of the whole bone	7.15 cm.
Lateral maximum diameter of the whole bone	9.5 "
Breadth maximum of the spinal canal	2.7 "
Antero-posterior diameter of the spinal canal	1.5 "
Height of the body of the vertebra, anteriorly	2.65 "
Height of the body of the vertebra, posteriorly	2.00 "

The body is somewhat higher on the right than on the left side.

SCAPULA

The portion of the right scapula shows that the whole bone was rather submedium in strength and size. The suprascapular notch is shallow.

CLAVICLES. RIBS

Both the clavicles and the ribs are of moderate strength; form normal. All the bones are damaged.

UPPER EXTREMITY

There are present, as hitherto remarked, only the bones of the right arm and forearm. All these are of moderate strength and of quite ordinary form. The olecranon fossa of the humerus is not perforated and there is no trace of the supracondyloid process.

The measurements are:

Humerus:	Length maximum	30.5	cm.
	Diameter antero-posterior at middle	2.35	"
	Diameter lateral at middle	1.7	"
	Shape of shaft 6 (plano-convex [1]).		
Radius:	Length maximum	24.2	cm.
	Shape of shaft 3 (anterior surface concave).		
Ulna:	Length maximum	26.0	cm.
	Shape of shaft 1–3 (intermediate).		

Humero-radial index 79.3, which is between Turner's mesatikerkik and dolichokerkik divisions. In whites this index is generally below 75; in African negroes between 75 and 79; in North American Indians, males, between 75.8 and 79.9, in the mean (Wyman, Davis, Russell, and Huxley).

LOWER EXTREMITIES

All the long bones present; all medium strong and normal conformation. The right femur shows signs of an ancient, very oblique, well-repaired fracture above the middle of the shaft. The measurements are:

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[1] See "Typical Forms of Shaft of Long Bones," *Proceedings* Assoc. Amer. Anat., 14th session, 1900, pp. 55–60.

Femora :	Length, left, oblique, 42.7 cm., maximum	42.9 cm.
	Right, oblique (39.4 cm.), maximum	(39.8 ")
	Diameter antero-posterior at middle	2.9 cm.
	Diameter lateral at middle	2.4 "
	Diameter antero-posterior at upper flattening	2.2 "
	Diameter lateral maximum at upper flattening	3.2 "
	Index at upper flattening	**68.7**
	Shape of shaft, left, 1–r (intermediate).	

Linea aspera moderate ; no third trochanter ; neck short, angle medium.

Tibiæ :	Length, minus spine, right	35.8 cm.
	Length, minus spine, left	35.7 "
	Diameter antero-posterior at middle, right, 3.1 cm., at nutritive foramen	3.45 "
	Diameter antero-posterior at middle, left, 3.1 cm., at nutritive foramen	3.5 "
	Diameter lateral at middle, right, 2.3 cm., at nutritive foramen	2.4 "
	Diameter lateral at middle, left, 2.3 cm., at nutritive foramen	2.5 "
	Index of right at middle **74.2**, at nutritive foramen	**69.6**
	Index of right at middle **74.2**, at nutritive foramen	**71.4**

Inclination of head moderate. Height of maleolus, both sides, 0.8 cm. The indexes of the tibia are somewhat higher than the average in North American Indians. Shape of the shaft of the tibiæ: right 1–4 (intermediate), left near 1 (nearly prismatic).

Fibulæ :	Length maximum left 34.4 cm.	right damaged.
	Shape of shaft, in both 2	(lateral prismatic).

Tibio-Femoral Index :	Oblique length of femur	**83.6**
	Maximum length of femur	**83.2**
	Oblique length of femur and tibia less spine and maleolus (Turner)	**82.2**

The tibia is nearly dolichoknemic (Turner) and agrees well in relative length with the tibiæ of North American Indians in general.

The intermembral index can be calculated only from the lengths of the left lower and right upper extremities. Taking the maximum length of the arm-bones, the oblique length of the femur, and the maximum minus-the-spine length of the tibia (more accurate, even if otherwise less satisfactory length, than the one minus spine and maleolus), the intermembral index is **69.8**, which also agrees well with that in other North American aborigines and is but slightly higher than that in Europeans (Europeans, mean, about 69.5, anthropoids 103.5 to 141, Turner).

The femoro-humeral index (oblique length of the femur), which amounts on the average to about 72.5 in whites (Turner), and ranges from 97.7 to 133.4 in apes, is in this skeleton **71.4**.

PELVIC BONES AND PELVIS

The *sacrum* shows moderate dimensions and a moderate, nearly uniform, curvature. It measures 10.8 cm. in height and 10.9 cm. in maximum breadth, which gives the sacral index of **100.9**. The same index is about 112 in male Europeans, 106 in the Negro, 99 in the Australian, and from 89 to 72 in anthropoids (Turner).

The *Ossa innominata* are of medium strength and are rather small; the iliac fossæ are not translucent as is usual in Europeans.

Height maximum, mean..........................	19.3 cm.
Distance from anterior to posterior superior spine...	14.0 "
Index of ossa innominata.......................	**72.5**

The pelvis as a whole is not large nor massive, and is distinctly masculine (subpubic angle 55°).

Measurements:

Breadth maximum between the external iliac crests.........	24.7 cm.
General pelvic index $\left(\frac{\text{breadth of pelvis} \times 100}{\text{mean height of ossa innominata}}\right)$............	**128.0**[1]

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[1] According to the method followed by Turner $\left(\frac{\text{mean height of ossa innominata} \times 100}{\text{breadth of pelvis}}\right)$ it is 78.1.

Diameter antero-posterior of the superior strait..........	10.7 cm.
Diameter lateral maximum of the superior strait..........	11.4 "
Index of the superior strait or pelvic inlet................	93.9

The general pelvic index averages about 127 in male Europeans, 121 in male African Negroes, and 106 in anthropoids (Topinard). The superior strait index is generally below 90 (platypellic) in whites, from 90 to 95 (mesatipellic) in Negroes, and from 126 to 151 (hyper-dolichopellic) in anthropoids (Turner). The Talayote pelvis is mesatipellic, or somewhat rounder, at the superior strait, than the pelvis of a European.

Other measurements:

Diameter between the points of the ischiatic spines........	8.3 cm.
Lower extremity of sacrum to lower edge of pubic symphysis	8.1 "
Pubis to tip of first spinous process on the sacrum, externally	16.5 "

PATELLA

Left:	Height......................	4.0 cm.
	Breadth......................	4.0 "
	Maximum thickness...........	1.8 "

OS CALCIS

Right:	Length............................	7.4 cm.
	Height of body (middle)........	3.85 "
	Breadth of body (minimum at middle)..	2.65 "

Peroneal spine absent; astragalus facet single.

RÉSUMÉ

The subject examined presents, as the main peculiarity, a small and otherwise inferior Indian cranium. The exceptional characters of the skull are apparently not racial features, but individual modifications. The rest of the skeleton is not in accord with the skull; although not without some special points of interest, it is, so far as can be judged from the rather scant data available for comparison, a fairly ordinary Indian skeleton. In this respect it differs considerably from the previously described skeleton from the valley of Mexico.

The painting of the bones requires special notice.

NOTES ON PAINTING OF HUMAN BONES IN AMERICA

The subject of bone-staining and bone-painting has been brought repeatedly to my attention during the last few years while engaged in examining the osseous remains of various Indians. So far as I have had occasion to observe, there are five distinct varieties of pigmentation of the bones.

The first variety, which is quite common, includes the skeletons that have been more or less stained or infiltrated accidentally by the coloring matter of the earth in which they have lain. As pronounced examples of this variety of staining I may mention the bones of a part of Mr Bandelier's collection from Bolivia (A. M. N. H.), which are thoroughly stained and infiltrated by red clay. This accidental staining is mostly reddish or yellowish, but it may be dark, as was observed by Professor Putnam in certain burial places in Tennessee, and as can also be seen in a number of Florida skulls in the American Museum. Usually in these cases all the bones of the body are colored, and with little difference in intensity.

The second variety of stained bones consists generally of skulls which had been stained green by salts of copper. These salts resulted mostly from the decomposition of copper ornaments or implements buried with the bodies. The staining in these cases, as a rule, is but partial; the coloring is greenish and is deepest at the points of contact with the decomposed articles.

In the third and probably the most frequent and widely distributed variety of stained bones, there is more or less staining of the skeleton by pigments which were buried with the body. In most cases known to me, or of which I have found mention in literature, the coloration was red, and in most instances due to red ocher. In a few cases, probably more recent burials, the pigment was vermilion.

The fourth class of stained bones seems to be much more restricted than any of the preceding; it consists mainly of skulls which had been painted by hand. In all but one case known to me the paint was red, and was applied sometimes over the facial parts of the skull only, at other times over the whole cranium, and in a few instances also over other bones of the skeleton. I am enabled to cite examples of this class from United States, Canada, and other regions.

The fifth and final variety of bone-staining consists of skulls on which designs have been made in colors. Such specimens thus far found are few and they are probably all recent.

It is principally the last three varieties of pigmented bones which are, each in a distinctive way, of ethnological interest, for they represent so many different, though probably related, customs of the American aborigines.

The geographical distribution of stained or painted bones on this continent appears to be very wide, but so far is quite irregular. With the increase of material, some of the existing lacunæ will undoubtedly be filled, while in other cases there will be traced, according to indications, allied customs. On the whole it seems that one or another use of red pigment, particularly ocher, has been quite general in the funerary rites of the American Indians.

The deposit of pigments, particularly of ocher, in the shape of paint, with the bodies of warriors, and especially of chiefs, seems to have been very prevalent, if not general, among the North American Indians from remote times. Red paint was one of the Indian's necessities, and, with some of his other possessions, was buried with him as a part of his equipment for the future world or his journey thither. Lafitau (11, 8, p. 413), in referring to the articles generally interred with the body of an Indian, mentions, among other things, "a quantity of oil and some color with which to paint himself." Loskiel (11, p. 120) tells us that the Indians formerly "used to put a tobacco-pouch, knife, tinder-box, tobacco and pipe, bow and arrows (or a gun, powder and shot), skins and cloth for clothes, *paint*, a small bag of Indian corn or dried bilberries, sometimes the kettle, hatchet, and other furniture of the deceased, into the grave, supposing that the departed spirits would have the same wants and occupations in the land of souls as they had in this world. But this custom," Loskiel says, "is now [in 1794] almost entirely abolished in the country of the Delawares and Iroquois."

Among the Hurons, according to Sagard (*Histoire du Canada*, Paris, 1636, III, p. 647), some paint was buried with the women, in order that they could paint their robes. Quantities of red ocher have been found in ancient Maine graves by Mr C. C. Willoughby, of the Peabody Museum. Rev. J. M. Spainhour, in 1871, found in a mound on St John's river, North Carolina, three skeletons, and with each a quantity of red pigment (Yarrow, p. 27). According to Elliott (I, 60) and Young (p. 142), "the first Europeans who came to Cape Cod found there in an Indian grave nice matting, a bow, a decorated and painted board, and two bundles of red powder, in which lay the bones of the buried."

Mr Moorehead found red ocher, and in a few instances also yellow and white mineral paints, heaped, as he expresses it, on or near the hands or other parts of the body, in earth mounds in several parts of Ohio. Lewis and Clark (I, p. 239) mention having found some red and blue paint with the cadaver of an Assiniboin female. Mr H. I. Smith, of the American Museum of Natural History, unearthed a skeleton at Saginaw, Michigan, which was covered with red pigment, the surrounding soil being of a totally different character. Dr J. Walter Fewkes found vessels containing "yellow ocher, sesquioxide of iron, green copper carbonate, and micaceous hematite" in what was apparently the burial of a priest, at Awatobi, a ruin at the base of what was formerly the first mesa of the Hopi Indians, in northern Arizona; and he found similar pigments in graves at Sikyatki, another ruin in the same region. Examples of a similar nature could be multiplied.

In a number of instances it is difficult, if not impossible, to decide whether the given bones have been stained accidentally by the pigment buried with the body, or whether they have been intentionally painted.

Judging from the references to Indian mortuary customs, made by various authors, there were apparently a large number of instances in which in addition to, or possibly without, the deposit of some pigment with the deceased, the body, or at least the face, was painted. If the pigment used was mineral in character, as was almost invariably the case, the probability of the bones becoming stained by it after the flesh had decayed cannot be excluded. The custom of painting the body is especially well described by Lafitau. Speaking of the Indians of New France, he says that among them every "cabane" had special individuals who took care of the deceased. Those who are thus employed "wash the body, oil it, and paint its face and head. . . . Sometimes the man while yet living announces his death, arranges a feast, and lets himself be washed, oiled, and painted, and bundled up still alive into the position which he is to have in the grave."

Loskiel gives similar information about the Indians of the eastern states and Canada: "Immediately after the death the corpse is dressed in a new suit, with the face and shirt painted red, and laid upon a mat or skin in the middle of the hut or cottage." Charlevoix (VI, p. 107) says that among the Canadian Indians "the dead man is painted, enveloped in his best robe, and, with his weapon beside him, is exposed at the door of his cabin in the posture which he is to preserve in the grave." Sagard (III, p. 649), speaking also of more than one northeastern tribe and without mentioning any separately, says that "not only are the savages in the habit of painting their faces black when any of their relatives dies, but they paint also the face of the cadaver."

The Iroquois, according to La Potherie (III, p. 9 et seq.), "visit from time to time the burial place, paint the half-rotten bodies, change their clothing and rearrange them in the fossa." Morgan also mentions the face-painting of the dead Iroquois.

All the nations of the upper Missouri, according to Perrin du Lac, painted the bodies of their dead warriors with red ocher. These tribes comprised the Ricaras, Mandans, Gros-ventres, Chugayennes, Sioux, Cayoroas, Tocaninambiches, Tokionakos, Pitapahatos, Padaws, Halisanes, Assiniboins, and Crows. The custom was witnessed among the Crows as late as 1870 by Col. P. W. Norris, Superintendent of the Yellowstone Park (cited by Yarrow); and quite as late among the Dakotas by Surgeon L. S. Turner, U. S. A. (also cited by Yarrow). "The work among the Dakotas," says Dr Turner, "begins as soon as life is extinct. The face, neck, and hands are thick-painted with vermilion or a species of red earth found in various portions of the Territory."

The Creeks practised a similar custom[1] and there are indications of the former existence of a similar habit among the Omaha.

Professor Boas informs me that many of the tribes of the North and Northwest paint the faces of their dead; he has observed the use of other colors than red, though the latter predominates.

As to the Southwest and Mexico, information on this subject is very meager, but evidence points to similar practices.

Bone-painting proper is comparatively rare, or at least much less common than the custom of paint interment and of the painting of various parts of the corpse. We meet with instances of bone-painting proper in Ohio, Florida, and South Carolina, in the East; in California, and possibly in British Columbia, in the West and Northwest; in Mexico, and in a few parts of Central America and South America.

In Ohio painted bones were found by Prof. F. W. Putnam

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[1] Schoolcraft, V, p. 270.

(Turner group mounds) and by Mr W. K. Moorehead. The latter writes[1] me on the subject as follows:

"Painted bones have been found in a mound at Omega, Ross county, Ohio; in Jackson county mound, Ohio, and in two mounds within the corporate limits of Chillicothe. One of the latter was discovered by Mr Clarence Loveberry, assistant curator of the above [Ohio Archeological and Historical] Society. The others were found by myself. Near Green Camp, Marion county, Ohio, in a stone grave six feet below the surface, Mr Loveberry discovered a skeleton entirely painted.

"All of these were coated with red pigment or ocher, and in nearly every case all of the larger bones. There are other instances in which just the hands, or the feet, or perhaps the skull were coated. These are usually from mounds, either large or small. Bones on which the pigment was simply heaped, were clearly distinguished by the surrounding soil being also stained.

"I have never observed instances in which skeletons were coated with yellow or black paints. (We have found yellow and white mineral paints near the hands of skeletons several times.)

"We have never found painted bones in stone mounds. They are invariably in earth mounds or stone graves."

In South Carolina the custom is thus described by Lawson (pp. 21, 22):

"As soon as the party is dead, they lay the corpse upon a piece of bark in the sun, seasoning or embalming it with a small root beaten to powder, which looks as red as vermilion[2]; the same is mixed with bear's oil to beautify the hair and preserve their heads from being lousy, it growing plentifully in these parts of America. After the carcass has laid a day or two in the sun, they remove and lay it upon crotches cut on purpose for the support thereof from the earth, then they anoint it all over with the fore-mentioned ingredients of the powder of this root, and bear's oil. When it is so done, they cover it very exactly over with bark of the pine or cypress tree, to prevent any rain to fall upon it, sweeping the ground very clean all about it.

"As soon as the flesh grows mellow, and will cleave from the bone, they get it off and burn it, making all the bones very clean, then anoint them with the ingredients aforesaid, wrapping up the skull (very carefully) in a cloth artificially woven with possum's hair. . . . The bones they carefully preserve in a wooden box, every year oiling and cleansing them; by these means preserve them for many ages, that you may see an Indian in possession of the bones of his grandfather, or some of his relations of a longer antiquity."

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[1] Letter dated Sept. 21st, 1897.

[2] Sanguinaria?

In Florida bone-painting seems to have been practised extensively and from an early period. The custom is mentioned in this part of the country by Garcilasso de la Vega and by Herrera. Romans (p. 88) describes it among the Choctaw as follows:

> "The day [of the burial] being come, the friends and relations assemble near the stage, a fire is made, and the respectable operator, after the body is taken down [from the stage on which it has lain for two to four months], with his nails tears the remaining flesh off the bones and throws it with the entrails into the fire, where it is consumed; then he scrapes the bones and burns the scrapings likewise; the head being painted red with vermilion is with the rest of the bones put into a neatly made chest (which for a chief is also made red) and deposited in the loft of a hut built for that purpose, and called bone-house; each town has one of these; after remaining here one year or thereabouts, if he be a man of any note, they take the chest down, and in an assembly of relations and friends they weep once more over him, refresh the color of the head, paint the box, and then deposit him to lasting oblivion.
>
> "An enemy and one who commits suicide is buried under the earth as one to be directly forgotten and unworthy of the above ceremonial obsequies and mourning."

The late Andrew E. Douglass found painted bones near St Augustine, Florida.[1]

In California, the custom of bone-painting seems to have been practised very extensively. I handled some apparently painted California skulls in the National Museum at Washington. Dr H. F. ten Kate discovered several painted skeletons in southern California (a cave on Espiritu Santo island) and M. Diguet found others in the valley of Las Calaveritas. All the specimens from this part of the country were painted red; those discovered by ten Kate and those which I saw were colored with ocher, while Diguet's specimens were decorated with a paint obtained from volcanic ashes. According to M. Diguet (p. 43), the localization of the burials in which painted bones are found is restricted to "the islands of Espiritu Santo and Cerralbo, and a number of localities on the peninsula reaching in a straight line from the Gulf of California to the Pacific ocean."

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[1] Sanchez Mound, situated about 8 miles north of St Augustine. Over 20 bodies found. "Each cluster of bones was surmounted by the skull, and the whole mass encrusted with red paint, which discolored the sand an inch around them" (*Proceedings* Am. Assoc. Adv. Sci., 1882, XXXI, p. 587).

Professor Boas informs me that some red skeletons have been excavated near Thompson river in British Columbia, but it is not certain whether these bones were accidentally stained or intentionally painted. In the collection of the American Museum of Natural History is a skull (No. 99–1604), of a Clayoquot warrior from the west coast of Vancouver island, that is painted outwardly a very dark brown. There are other skulls from the Northwest in the collection that show red stains (particularly No. 99–3047, Copalis, west coast of Washington; Smith), but in these intentional painting is doubtful.

In Mexico, I have never found any color stain on the bones of the Tarahumare; however, the Tepehuane region, whence came the painted Talayote skeleton described in this paper, adjoins on the south that of the Tarahumare.

Several of the Tarasco crania from Michoacan (No. 99–175, for example) in the Museum collection show red stains, but these may be accidental.

Finally, the Museum collection includes several skulls and some bones of ancient Zapotecs and Mixtecs, collected by Mr Saville in Oaxaca, and some of these show plain and indubitable signs of red painting.

As to Central America and South America, one of the two references to the custom which I have noted concerns the Caribs, who, according to Brinton's *Myths of the New World* (p. 225, after Gumilla), about a year after death cleaned the bones of their dead, bleached them, painted them, and wrapped them in odorous balsams; they were then placed in a wicker basket which was kept suspended from the door of the dwelling. "When the quantity of these heirlooms became burdensome, they were removed to some inaccessible cavern and stored away with reverential care."

The second instance pertains to the Bororos, one of the Amazon tribes, who, according to Ehrenreich, bury the body about two weeks after death, decorating the head with small red feathers and painting the bones red.

I have thus far found no historical evidence of bone-painting in Peru. Among more than five hundred ancient Peruvian crania in the American Museum there is but one that shows distinct red stains, but these seem to be more accidental than otherwise.[1]

The painting of designs on human skulls requires but few words. I have seen but three specimens of this sort, and found no mention of others. One of these skulls came from California and is preserved in the National Museum at Washington; the other was found by Mr H. I. Smith at Lytton, British Columbia, and is in the American Museum of Natural History, New York. The design on both these skulls consists of a red cross. It was made, in all probability, quite recently by some christianized Indians. The third, which I came across recently, is a skull decorated with brown streaks and made into a stringed musical instrument. The specimen is preserved in the Metropolitan Museum of Art, New York, and is supposed to be of South American Indian origin. Thus far the Museum has no further information.[2]

Beyond this continent painted bones were found especially in Crimea (Vasselovski), and in many parts of southwestern Russia (Antonowitch, Zaborovski, etc); but they are not restricted to Europe. Skulls with painted designs, of quite recent origin, were found in Tyrol and are now preserved in the Zuckerkandel collection in Vienna.

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[1] Since this was written, the American Museum of Natural History has received the Gaffron collection of skulls from Peru, and one among these (that of a male), from the neighborhood of Cuzco (No. 99–3682), shows over large portions of its surface a pink incrustation, in all probability the remnant of intentionally applied paint.

[2] There is a possibility that this skull is from Africa.

THE SIGNIFICANCE OF BONE-PAINTING

Bone-painting among the American aborigines seems most probably to be a development of the custom of painting the corpse, just as the latter is an extension of the custom of painting the living. Paint, particularly red paint, was, and to some extent still is, among many American Indians, a part of the warrior's preparation for battle, and it was a mark of fitness, elevation, bravery, honor; and some of the tribes honored their distinguished dead, or even all their dead, with paint applied for a similar object and in more or less the same manner in which it was used by the living. The bones of deceased friends were regarded with reverence. According to Brinton (op. cit., p. 257), the opinion underlying all customs connected with the preservation of bones among various American people was "that a part of the soul, or one of the souls, dwelt in the bones; that these were the seeds which, planted in the earth, or preserved unbroken in safe places, would, in time, put on once again a garb of flesh, and germinate into living human beings. Language illustrates this not unusual theory. The Iroquois word for bone is *esken*, for soul, *atisken*, literally that which is within the bone (Bruyas, *Rad. Verborum Iroquœorum*). In an Athapascan dialect bone is *yani*, soul *i-yune* (Buschmann, *Athap. Sprachstamm*, pp. 182, 188)."

Yet there may have been instances in which the flesh or the bones of the dead were partly or wholly painted for other reasons. It is probable that in some instances the paint was considered a necessary equipment for the journey to the future world. Lafitau (II, 8, p. 388) says that the Indians "applied the paint to the head and face in order that the horrors of death should not be seen." According to Professor Boas, among the Chinook, who bury their dead mostly in canoes raised above the ground, after a time "the burial place is made good with red paint," which implies that in this tribe such paint is connected with some superstition. Finally, according to Bandelier, among the Muysca in Bogota, New Granada, bodies painted with red ocher were a sign of deep mourning. The Navaho use red paint largely as a protection against sun and wind, and it is not impossible that among some tribes paint may have been applied to the dead as a preservative.

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SUMMARY OF THE ARCHEOLOGY OF SAGINAW VALLEY, MICHIGAN—III

By HARLAN I. SMITH

SAGINAW RIVER VALLEY

SAGINAW COUNTY

Melbourne Fields.—On August 28, 1890, Mr W. R. McCormick informed the writer that there were traces of ancient cornfields at Melbourne.

Carrollton Graves.—At Carrollton, on the west bank of Saginaw river, the sand-ridge is low and of dark material. On each side of the river marsh-land stretches away for miles. In 1893 Messrs Joseph and William Baird, and Mr Miles Purcell, and in 1894 Mr Ezra J. Demorest, reported that, when the foundation for the salt block in connection with the Bliss mill was being dug, human bones were found.

Hoyt Camp Site.—On the high sandy square now occupied by the post office and Hoyt Library in Saginaw, East Side, there were found potsherds, numerous chips and flakes of chert, and points chipped from the same material for spears, arrows, knives, drills, and scrapers. These seemed sufficient to indicate that the place was a camp site. Assistance was rendered in collecting at this place by Mr George Stevens and the late Mr Platt R. Bush.[1]

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[1] Platt Richard Bush, C.E., was born in Pentwater, Michigan, August 3, 1873. While professionally a civil engineer, he took a sincere interest in anthropology, giving much time in assisting the author in prosecuting excavations, in field work, and in drafting plans and maps, as is acknowledged in each case, although he expected no compensation and asked no such credit in the published results; indeed, he evidently desired no benefit other than the inward satisfaction of furthering knowledge of archeology. By his untimely death on October 4, 1898, anthropology lost a sincere friend as well as an active and generous constituent.

Warner Grave.—A human skeleton was found on the eastern side of Saginaw river, in the City of Saginaw, where the Cincinnati, Saginaw, and Mackinaw railroad passes through a sand-ridge at a point about one hundred and fifty feet east of the river, and directly north of the railroad switch. Here the black surface sand overlies a clay subsoil. About 1888 the mass of human bones was found resting on the subsoil at a depth of about two feet in the sand. It was entirely surrounded by a sandy material resembling in color red brick mortar with a slight purple shade. Some potsherds were found with it.

Lee Graves.—Human skeletons were found in the sand-ridge on the eastern side of the Saginaw river at the foot of Hoyt street. This was reported, about 1886, by workmen engaged in laying pipes in the street in front of the Lee mill.

McCoskry Camp Site.—Potsherds marked by cord impressions have been found on lot 10, block 26, Emerson's addition to the City of Saginaw, the second lot south of Meredith street on the ridge east of the bayou and Jefferson avenue. These would seem to indicate a small camp site.

Brooks Graves.—A number of human skeletons were found in the highest part of the sand-ridge located on lot 13, block 47, Emerson's addition to the City of Saginaw. The lot, which is owned by Mr George B. Brooks, is situated south of Meredith street and east of the river and Washington avenue. It was reported by Mr Brooks in 1894 that the skeletons were found several years earlier in excavating for the cellar of the house and that they were resting extended upon their backs, the heads lying in a small circle, with the bodies radiating from the central point.

Wright Graves.—A number of human skeletons were found at the base of the sand-ridge near the western end of the Middle Bridge. This was reported, about 1883, by Mr Guy Kennedy, who stated that the discovery was made by workmen while laying water-pipes.

Saginaw Grave.[1]—A human skeleton was found about 1886, on the western side of the river, across the road to the west from the Court Street depot. This was near the site of Fort Saginaw and the first Saginaw trading-post. The place is at the base of the slope from a high ridge to the river. Mr Zachariah Baskin, captain of police, reported all the facts about the grave. It was one foot below the original soil, which had here been covered by about three feet of filling since the establishment of the city. The head was south, the foot north. A copper kettle, parts of a gun, glass moccasin beads, rings, and two metal bracelets prove this burial to be one of those made since the advent of the whites. One of the bracelets is small, as if for the wrist, while the other is large enough for the upper arm and shows impressions of a feather or feathers in the copper salts which incrust it. The bracelets seem to be made of an alloy plated with silver, and were doubtless purchased from French traders, probably within the last one hundred and fifty years.

Tik-wak-baw-hawning.—According to the *History of Saginaw County* (p. 772), " The territory embraced in the township of Buena Vista was called by the aborigines Tik-wak-baw-hawning, or Hickory place, " and (p. 592) " was bounded on the north by Waig-hawning creek."

Germain Village Site.—About opposite the site of the Saginaw grave, on the crest of the sand-ridge following the bank along the eastern side of the Curt Emerson bayou, were found evidences of a village site. These were mainly on the land of Mr Edward Germain, lot 50 of Hoyt's subdivision of the James Riley reservation of the City of Saginaw. A few evidences were found on the lots, parallel to this, of Messrs W. G. Gage and W. H. Clark lying next north, and of Messrs E. T. and Clarence Judd lying next south. We have no data from the lots farther southward until the Ayres camp site is reached about an eighth of a mile away. It is possible that these two places were parts of a continuous village site. The brow of the hill at this point is one hundred and thirty-eight feet east of the bank of the bayou. The clay subsoil is reached at a depth of about ten feet. Above it is a stratum of gravel, and on that a layer of light yellow sand over which lies the surface soil—a black sandy mold. In places the black soil fills depressions in the light sand, suggesting that they were storage pits or graves in which all traces of bones have vanished, leaving only the darker soil in the surrounding stratum of light sand. On the surface along this ridge there have been found numerous chipped points for spears, arrows, and knives, as well as potsherds, a sandstone tablet bearing incised lines, and an unfinished bird-shaped object. The last specimen had been pecked into form, but was polished only in places. In the refuse from the Germain graves, which may have come from the Germain village site rather than from these graves, were found a chipped chert arrowpoint, a piece of antler cut diagonally across to form a wedge-shaped implement (perhaps a wedge or club-head), and a broken gorget. Assistance was rendered in collecting at this site by Mr Fred Lange and Mr Charles Tiebs.

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[1] See *Saginaw Evening News*, June 1, 1888, and *American Antiquarian*, vol. XI, No. 4, 1889, p. 249.

Germain Graves.—Three masses of human bones have been found by the writer on Mr Germain's lot, at intervals of about thirty feet along the crest of the ridge, and another mass was procured approximately the same distance back from the most northerly of these three. All of them had been plowed out, so that the particulars of burial were lost. The bones were soft and chalky; some of them were colored by a material resembling red brick mortar with a slight purple shade, similar to that found in the Warner grave.

A skull, with cuts along the left parietal, was procured through the courtesy of Mr William Glover Gage, who obtained it from this place.

In 1893 Mr Orla Milligan reported that he had found bones here. I am indebted to him for these specimens, which proved to be human and represented at least four individuals, two of whom were children. One of the skeletons was undisturbed, and Mr Milligan removed it, reporting that it was found resting upon the back at full length, with the head toward the east. The arms were straight and extended slightly away from the sides of the body. Between the arm-bones and the ribs were five chipped points of stone. There were traces of a wooden box surrounding the skeleton, but no nails were found.

Workmen unearthed and reported skeletons of eight individuals at this place. They said iron knives were found with some of them.

Mr Charles H. Tiebs, the gardener for Mr Clarence Judd, reported that he found four more skeletons at a point in Mr Judd's garden about two hundred feet along the ridge on the second lot to the southward. The specimens found in the refuse from the Germain graves have been mentioned in the description of the Germain village site.

Germain Mounds.—Eight mounds were formerly situated on the Germain lot, but these were farther back from the bayou than the graves, and were beyond the sand-ridge. They rested directly upon the clay subsoil; all were of rectangular form and approximately one foot in height. They were composed largely of clay. The natural surface soil near them is vegetal mold.

Nothing has been found in these mounds to prove that they were made by the Indians, while cut iron nails and the fact that recruits for the Civil War camped in this vicinity suggest that they may possibly be the remains of temporary structures erected by the soldiers. Further evidence cannot now be obtained, as the mounds have all been destroyed.

No. 1 (9) was four hundred and three feet east of the Curt Emerson bayou, or two hundred and sixty-five feet beyond the Germain graves and forty-two feet south of the northern boundary of the lot. The mound was ten feet four inches long, east and west, by seven feet three inches wide. It was explored and found to be made of burned clay interspersed with ashes and bits of charcoal to a depth of one foot. Below this was a lime-like substance and ashes in which were found bits of bone. Some of these bones were greenish in color, but no copper was found with them. There were also found some cut iron nails, and a soft red stone possibly used for paint. The soil showed no evidence of disturbance below a depth of about eighteen inches.

No. 2 (8) was twelve feet west of No. 4 and sixty-two feet five inches south of the northern boundary of the lot. It was six feet six inches long, east and west, by six feet wide. A hole to the southeast suggested the origin of the material of this mound.

No. 3 (6) was forty-four feet east of the nearest part of No. 1 and forty-two feet eight inches south of the northern boundary of the lot. The corners were much rounded by erosion and a longitudinal depression extended down its center. It was ten feet eight inches long, east and west, by seven feet four inches wide.

No. 4 (7) was directly south of No. 3 and fifty-two feet nine inches south of the northern boundary of the lot. The corners formed right angles. It was six feet six inches long, east and west, by four feet six inches wide.

No. 5 was thirty-eight feet east of No. 3 and forty-three feet seven inches south of the northern boundary of the lot. The eastern end was rounded and slightly higher in the center than other parts of the mound. It was twelve feet two inches long, east and west, by five feet ten inches wide. White ashes, charcoal, burned bone, baked clay, and an iron nail were found in this mound.

No. 6 (4) was forty-six feet east of No. 4 and fifty-four feet eight inches south of the northern boundary of the lot. It was nine feet long, east and west, by six feet eight inches wide. There was a hole, recently dug, at the west which had greatly injured the mound.

No. 7 (3) was thirty-eight feet east of No. 5 and forty-eight feet ten inches south of the northern boundary of the lot. It was eleven feet eight inches long, north and south, by eight feet two inches wide. The corners were much eroded.

No. 8 (2) was fifty-two feet five inches east of No. 7, forty-two feet one inch south of the northern boundary of the lot, and seventy-seven feet two inches west of the nearest point of Washington avenue. It was ten feet nine inches long, north and south, by six feet wide.

Hoyt Mounds.—According to oral reports by Mr William H. Clark, jr, there were mounds resembling the Germain mounds, which he had seen east of them, in Hoyt Park, on the brow of the clay ridge where it descends to the bayou to the east of it. These, however, were destroyed, by so-called landscape gardeners who graded Hoyt Park, instead of being preserved in the park as objects of historic interest.

Ayres Camp Site.—A camp site was located on the ridge which lies east of and parallel to the southern end of the Curt Emerson bayou, only about an eighth of a mile south of the Germain village site and possibly formed the southern end of the latter. At present, however, we have no evidence of this from the space between the Germain village site and the northern end of lot 49 of the James Riley reservation of the City of Saginaw. South of here evidence is most frequently found on the slope of the ridge rising from the Curt Emerson bayou, but enough has been seen to suggest that the full width of the ridge was inhabited as far east as the slope which descends to the second bayou east of the river. The ridge terminates at the little creek which flows out of the second bayou with a semicircular sweep and discharges into the southern end of the Curt Emerson bayou. This ridge is mainly of clay with a surface soil of black loam, but along the western slope the surface soil is dark sand which is sometimes shifted by the wind. The underlying material at this part of the ridge is a light-colored, finegrained gravel. The site was probably a specially fortunate one for an Indian camp, since the border of the Curt Emerson bayou as late as 1880 was an excellent hunting-ground for woodcocks, ducks, and similar game, while the adjacent waters were unusually well supplied with pickerel, bass, and other fish. Burned and crackled fire-stones, one of which was fractured; flakes of chert, some of which were from the outer surface of concretions (and one of these has secondary chipping along one edge sufficient to indicate that it was a flake knife); a chipped fragment of a battered, water-worn piece of chert; potsherds, and chipped points have been found here.

Ayres Mound.[1]—A mound was located at the Ayres village site on lot 43 of the James Riley reservation in the City of Saginaw, directly south of Court street. It was on the highest part of the clay ridge, some distance back from the sandy brow which follows the eastern bank of the Curt Emerson bayou, two hundred and eighty feet from the bayou and near Washington avenue.

Although not a large mound, this was a typical example of the low, dome-shaped mounds found in Saginaw valley. It was about thirty-four feet in diameter and eighteen inches in height. There is no doubt that it was once of greater altitude, and that it has been slowly reduced by erosion. In 1889 this mound, being covered with grass and flowers, had much the appearance of a neglected flower bed. The lot was then, as it is yet, covered by an apparently primeval forest of oak, elm, maple, walnut, and other trees. On the northwestern edge of the mound stood an oak seven feet four inches in circumference, which, having grown since the mound was built, showed that the structure was not recent.

Mr Charles W. Grant, residing on the lot next northward, was the first to call attention to this mound. Permission to explore the work was granted the writer, early in April, 1892, by Mr E. R. Ayres, who then owned the land. At that time the mound was photographed preparatory to beginning its excavation. A trench was dug down to undisturbed earth along the western edge of the southern half of the mound, and was carried eastward, covering the entire southwestern quarter of the work; that is, all the soil and other materials that had been placed by the builders were removed and examined. From the middle of the mound a narrow trench was continued eastward through it, exhibiting a cross-section of the entire mound. Returning some months later to complete the excavation, it was found that in the meantime the remaining part of the structure had been destroyed.

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[1] Smith (Harlan I.), "Primitive Remains in the Saginaw Valley, Michigan. The Ayres Mound": *The Archæologist*, vol. 1, No. 3, March, 1893, pp. 51–53. See also the same article, slightly condensed and revised, in *The Saginaw Evening News*, April 15, 1893. *The Saginaw Courier-Herald*, May 6 and 12, 1893, also gives an abstract.

The first layer of the mound, just below the sod, was about nineteen inches thick and composed of a dark, sandy mold, which could not be distinguished from the surface soil of the surrounding woods. Below this was a layer, varying from an inch to four inches in thickness, composed of black soil partly burned and thickly mixed with particles of charcoal. Between this layer of black material and the original surface of the clay below was a stratum of white ashes, which varied in width from a thin streak to two inches. Intermingled with the ashes were some large pieces of charcoal; and below this ash layer, with no black surface mold intervening, was the original clay of the ridge which had been burned in places almost to the hardness of brick. This layer of burned clay had a maximum thickness of about five inches, and below it there were no indications of previous disturbance by man.

It would seem possible that at the time the mound was built a fire had been made upon the ground, and that this burned the clay forming the first layer, consumed any carbonaceous surface mold that may have existed, and produced the ashes which formed the second stratum. Dark earth, possibly thrown on among the remains of the fire, formed the third layer, above which surface mold was gradually deposited by natural means.

In the ash layer at a point about eight inches west of the center stake was found a single copper bead. This bead is spherical, measures about three-eighths of an inch in diameter, and is so much corroded that no metallic copper can be seen even by scratching the surface deeply.

Ten feet west of the center stake and about fourteen inches south, was discovered, in the black layer, a chipped leaf-shaped chert point, and four feet south of this a scraper, chipped from a flake of chert, was found in the surface soil. In the black layer were many pieces of burned and crackled diabase and other hard rock. These were probably fire-stones which had been used in the old hearths to support pottery kettles and which were accidentally taken up with the earth used in forming the mound. Here also were found large pieces of chert concretions, such as occur in situ near Bay Port and which were so much used by the aborigines of the whole valley for material from which to fashion their implements. These were all much burned. In the surface layer were found many pieces of this chert which had not been burned and which showed scars where flakes had been removed, probably for the manufacture of knives and arrowpoints. Many scrapers and flake knives were also found in this surface layer, all showing concentric structure. All the chipped implements found in or near the mound were made of what appears to be this same concretionary chert.

In the narrow trench, about nineteen inches east of the center stake and in the black layer, were found two fragments of pottery about half an inch in thickness and coated with a black layer on what had been the inside of the pot, while the outer part was ocher in color. The material was thickly mixed with quartz grains. The outer surface of the dish had been ornamented with slight depressions placed at regular intervals of about a quarter of an inch; these were apparently made with some sharp instrument.

In the surface layer, near the eastern border of the mound, a fragment of a finely polished celt blade of greenish argillite was found.

Ayres Graves.—About 1890, while digging for the foundation of the salt block in connection with the Ayres mill, about three hundred feet west of the Ayres mound and one hundred and eighty feet from the bank of the bayou, workmen came upon a number of human skeletons. These were unusually deep, being over four feet below the surface. The wind has piled the light sand in long dunes in this vicinity and may have deposited an accumulation of soil above the surface of the graves. Among the bones of these skeletons were found bear-teeth, deer-bones, and similar kitchen refuse. From the large number of fish-bones found one might conclude that these people took advantage of the resources of this locality near the bayou and that much of their subsistence was obtained from its waters. It is a noteworthy fact that no implements of defense or utensils for domestic use were discovered with the remains, while at the Ayres mound, only three hundred feet distant, such objects were found.

(Saginaw County to be continued.)

RECENT PROGRESS IN ANTHROPOLOGY AT THE FIELD COLUMBIAN MUSEUM[1]

BY GEORGE A. DORSEY

In a previous number of the *American Anthropologist*[2] I presented a statement which covered the history of the Department of Anthropology of the Field Columbian Museum from its beginning to March of 1900. I shall now review the work of the department from the latter date to the present time. Inasmuch as the Field Columbian Museum begins its fiscal year on the first of October, I may consider the activities of the department from March, 1900, to October of the same year, and then review the work for the present year. I shall speak first of the accessions resulting from the various expeditions, and of other new material which has been procured by gift or purchase; and later, of the work of installation in the Museum.

ACCESSIONS

MARCH—OCTOBER, 1900

The most notable gift during this period was that of a large collection of Swiss-lake relics, presented by Vice-President Ryerson. This collection was obtained from a private collector in Berne, who had personally obtained the objects after many years of exploration in various Swiss lakes. The collection comprises over one thousand specimens, embracing all the various categories of objects usually found in a Swiss-lake collection of this magnitude. Inasmuch as the Museum possessed practically no collections representing prehistoric Europe, this gift by Mr Ryerson was most acceptable.

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[1] Read before Section H, American Association for the Advancement of Science, Denver Meeting, August, 1901.

[2] "The Department of Anthropology of the Field Columbian Museum—A Review of Six Years," vol. 2 (N. S.), April-June, 1900.

From the British Museum there were acquired by exchange sixty-six selected specimens illustrating the prehistoric archeology of England down to and including the Bronze age. With the Ryerson collection of Swiss-lake relics, and with this small collection from England, it is felt that a beginning has been made toward procuring from Europe material necessary in illustrating its prehistoric archeology.

The department also obtained, by exchange from the Museum of Liverpool, a carefully selected collection of specimens from Egypt illustrating the processes of manufacture of flint implements. These specimens are similar to those described by Professor Forbes in a paper on " A Collection of Stone Implements from an Ancient Egyptian Mine."

To the already extensive and valuable collection of objects illustrating the life of the Romans, was added very important objects obtained in behalf of the Museum by Mr E. E. Ayer. This collection consists of sixteen mural paintings and additional specimens of bronze, all from the villa of Bosco Reale. These late additions, together with other bronze and glass objects, including two great bronze bathtubs, probably the finest specimens ever found in Italy, make the collection from this interesting villa a notable one. The thanks of all American classical scholars are due to Mr Ayer for the untiring energy which he has shown in obtaining this collection.

Turning to America, in addition to the acquisitions already mentioned in the paper on the department, above cited, there was obtained by Mr D. G. Elliott, Curator of Zoölogy, as member of the Harriman expedition, a very large and well-preserved totem-pole from old Tongas, a Tlingit village in southern Alaska. Inasmuch as the Museum was already in possession of three large totem-poles from neighboring Haida villages, this Tlingit column is a welcome addition.

During the months of May, June, and July, the Curator of the department made an extended journey among several western Indian reservations, with a view to more extended work in the future. During the trip, however, more than two thousand objects were collected, illustrating more or less perfectly the following tribes: Arapaho, Shoshoni, Ute and Paiute, Pomo, Hupa, Klamath, Makah, Nez Percé, Assiniboin, Yankton, Sisseton, and Cut-head Sioux. The majority of these tribes had not previously been represented in the department, consequently the collection as a whole may be regarded as one of the most notable acquisitions of material made by it in recent years. Naturally, many reservations visited did not afford exceptional opportunities for collecting, owing to the greatly changed conditions of the Indians; while on other reservations, such as the Wind River in Wyoming, the Ute in Washington, and the two Sioux reservations in Montana, extensive collections were made, and on all the other reservations, as a rule, important collections were obtained. It is interesting in this connection also to note the fact that, on certain of these reservations where much valuable material was secured, no museum collections had ever been gathered.

During this western trip of the Curator a visit was paid to an extensive and interesting aboriginal stone quarry in eastern central Wyoming. Photographs and sketches were made of the main features of the quarry, and a large collection, including hammerstones and tools of various kinds, and a full series of flakes, cores, and rejectage illustrative of the processes of manufacture of flint implements, was gathered.

In the previous account emphasis was laid on the results of the systematic attempt, which had been made possible through the great generosity of Mr Stanley McCormick, to provide a faithful museum exhibit from the Hopi Indians of Arizona, and attention was called to the fact that a series of explorations were about to be undertaken which would give the department adequate collections of the fictile ware and other grave-products of the prehistoric Hopi. With this in view, Mr C. L. Owen spent eight months in Arizona, where he conducted a series of excavations in the ancient cemeteries of the ruins of Sikyatki, Awatobi, and Mishongnovi, all lying within sight of the present Hopi pueblos. He then proceeded about sixty miles north and excavated in the ancient town of Kish-u-u. This village, it may be said, plays a prominent part in the legendary history of certain Hopi clans, and from a spring near this ruin water is obtained for use in certain Oraibi ceremonies. As a result of Mr Owen's work in Arizona some twenty-five hundred prehistoric specimens were added to the Hopi collections, most of them being earthen vessels of the so-called yellow-ware type. The locality which yielded the most important collection was that of Old Mishongnovi, the ruins of which lie just under the shadow of and halfway down the mesa on which the present village of the same name is situated. In addition to the material procured by excavation Mr Owen acquired a large quantity of purely ethnological material, which is of the highest importance in making more complete the already extensive Hopi collections. This material consists for the greater part of Katcina masks not hitherto represented in the collections, and of *tihus*, or Katcina dolls, the majority of which are never made under ordinary conditions.

OCTOBER, 1900—OCTOBER, 1901

The energies of the department in the acquisition of new material during the present year have been exclusively confined to the North American continent.

Early in January, Mr Simms, Assistant Curator, undertook a journey in the Southwest, which lasted three months, and which had for its object the acquiring of specimens among tribes of the Piman and Yuman stocks, which, at that time, were unrepresented in the collections of the department. Mr Simms visited, in order, the Walapai, Mohave, Yuma, Pima, Maricopa, and Papago tribes, to each of which he devoted sufficient time to make as extensive and representative a collection as is possible under the present changed conditions. From all of them he obtained some material, and from the majority large representative collections which will ultimately prove of great importance in a comparative study of the tribes of the Southwest.

In the previous paper mention also was given of two visits which the Curator had made to the Pomo Indians of California, and of his meeting there with Dr J. W. Hudson, who had become deeply interested in the Pomo, and who had made what Professor Mason has declared, in a recent number of this journal, to be "the best scientific collection of basketry known to the writer from any people on earth."[1] I was impressed at the time with Dr Hudson's knowledge of the ethnology of the Pomo, and he seemed, in my estimation, to possess in an eminent degree the qualities which would fit him to conduct an extended series of investigations among the native tribes of California. Having this in mind, I succeeded in engaging the services of Dr Hudson for the Museum in January of the present year, and after a preliminary visit to Chicago, he returned to California and began his work. Up to the present time he has covered most thoroughly the various tribes of the Mariposan and Moquelumnan stocks, and is now at work among the Pujunan. The material forwarded by Dr Hudson to date has been very great in quantity, and in character of the highest interest and value. Along with the acquisition of his great collection he has been an indefatigable investigator, and has done much work in obtaining linguistic and other ethnologic data.

To conduct work on the four Shahaptian reservations, already referred to, Dr M. L. Miller, Instructor in Anthropology in the University of Chicago, was chosen. Dr Miller, before his return to Chicago, will have spent between five and six months in the field. Not all the material obtained by him has yet been received at the Museum; but, judging from the character and quantity of that which has been received, his investigations have been eminently successful. Necessarily it is not possible to do more than to characterize in the most general terms the various collections which Dr Miller has made, although the temptation to speak in detail concerning many of the objects is very great. The importance of the collection may perhaps best be illustrated by citing the fact that he has procured fourteen very old buckskin garments in good condition, and that he has obtained four very old buffalo parfleches with deeply incised ornamentation. Such specimens are today so rare as to be almost unobtainable.

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[1] Vol 2, No. 2, April-June, 1900, p. 346.

To supplement the collection made by Mr Simms from the Piman and Yuman stocks of Arizona, Mr Owen devoted the month of April and part of May to the White Mountain Apache reservation for the purpose of gathering a collection representative of this interesting and important Apache band. The collection obtained aggregates over five hundred specimens, and is of special value from the fact that it contains a large number of the painted poncho-like shirts of the medicine-men of the Apache—specimens so rare that even hitherto they have been practically unobtainable. In addition to these garments Mr Owen collected a large amount of other ceremonial paraphernalia of the Apache, together with objects representing their everyday life.

In connection with this work among the Apache, plans were made enabling Mr Owen to spend the month of September among the Navaho, for the purpose of gathering a representative collection to supplement the not inconsiderable Navaho collection already in the Museum. It thus becomes apparent that with the material which the Museum already possessed from the collections of Mr Ayer and others, with the acquisition made by Mr Simms from the tribes of the Piman and Yuman stocks, and with the collections made or to be made by Mr Owen among the Apache and Navaho, the non-pueblo tribes of the Southwest will be represented in a comprehensive manner.

The months of May and June were spent by the Curator of the department in Oklahoma, where he visited the Osage, the Pawnee, and the Wichita, obtaining from the three tribes about seven hundred objects. This was not to be wondered at, however, as these three tribes are extremely conservative, and, although they have long been in contact with the whites and have had access to considerable sums of money (especially the Osage, who are often spoken of as the richest of all of the American Indians), they were found to retain many ancient customs, and a careful search of the three reservations brought to light a large number of objects which had survived from the buffalo days of from twenty to more than a hundred years ago. Among the diversified categories of objects procured, of noteworthy interest are sixteen ancient buffalo-shields and a hitherto unobtainable sacred bundle of the Osage, together with a painted buffalo robe and many ancient ceremonial feast-mats and woven bags; from the Pawnee, a warrior's sacred bundle, a sacred medicine-stone, several ceremonial drums, and an unusually interesting and instructive series of games were gathered. From the Wichita, probably the most interesting objects collected were three painted buffalo hides.

To supplement the Northwest Coast collections, which, while very extensive and complete for certain localities and for certain tribes of the Northwest, are inadequate for other tribes, the service of Dr Newcombe is engaged in collecting specimens among the Haida of Queen Charlotte islands. The chief results of this work which have so far been received, consist of elaborately carved totem-poles and interesting specimens of carvings from houses, graves, etc.

Although a small acquisition, perhaps no single specimen was so highly prized as that consisting of two shields which were purchased from J. R. Roddy, a local dealer in Indian relics. These shields proved to be the identical specimens figured by Cushing in his article on "Zuñi Fetishes," in the Second Report of the Bureau of Ethnology. These shields, according to Cushing, were the fetishes of the Zuñi Priesthood of the Bow. On one is portrayed the Knife-feathered monster, while on the other is the picture of a mountain lion and of the thunderbird. Realizing the sacredness of these two ancient specimens, I was curious to learn how they had fallen into the possession of a trader. I was informed by Mr Roddy that he obtained them from the well-known curio establishment of Jacob Gold at Santa Fé, New Mexico. Mr Gold informed me recently that he obtained them from some Santa Ana Indians, who, in turn, claimed that they had obtained them from the Apache, the latter declaring that they had secured them when on a raid against the Zuñi. A comparison of the two shields with the drawings made over twenty years ago by Cushing reveals the extreme care which he had used in making his sketches. With the exception of a lightning symbol on one of the shields, both drawings had been made with remarkable accuracy; even the holes in the shields and the thongs had been represented correctly.

Also from Mr Roddy was purchased a small collection of about one hundred objects which he had gathered from time to time during his many years of close intercourse with the Winnebago. Among the many valuable objects in this collection is a very large double-headed drum of buffalo hide, together with four colored supports used for suspending the drum above the ground. Also of interest in this collection is a large series of beautiful wooden bowls, all highly polished from long use.

From the fact that the department had come into possession of an extensive series of games, a special effort was made by correspondence to collect games of tribes not already represented in the Museum. The result showed a gratifying interest on the part of a large number of Indian agents and school superintendents on various reservations in the United States and Canada. It is now believed that the department is in possession of the most diversified and extensive collection of American games to be found in any museum.

Turning from the ethnological acquisitions of recent months to those in the field of archeology, it is a pleasure to record, first, the fact that through the continued interest shown in the department by Mr Stanley McCormick, the well-known collection of Mr Frank Wattron, Sheriff of Navaho county, Arizona, was obtained. This collection consists of three thousand objects, mainly of prehistoric Hopi pottery, and was gathered under Mr Wattron's supervision. It comprises an extensive amount of material from the ruins of Sikyatki, San Cosmos, Round Valley, Mesa Redondo, Hawikuh, and Bitta Hoochie, all of these ruins lying between the present Hopi villages and the pueblo of Zuñi. This, it is believed, is the largest private collection ever formed in this region, and, owing to its value and importance in the study of archeology, forms one of the most notable gifts in the history of the department. In connection with this acquisition may be considered the further work and exploration which, with funds also provided by Mr McCormick, Mr Owen has been conducting among the ancient Hopi ruins during the last four months. The work of exploration this year has been practically confined to an extensive series of cemeteries lying near the foot of and on the western side of the East Mesa. They were no doubt the burial grounds of the ancient town of Walpi, which formerly occupied a site near by. The graves yielded an unusually interesting amount of material, comprising some fifteen hundred earthenware vessels, a large number of utensils and ornaments of bone and stone, and over a thousand *bahos* or prayer-sticks. On account of the wide range of the *bahos* secured from the graves, and their good state of preservation, it may not unreasonably be expected that this acquisition will form one of the most important ever made in any ruin of Tusayan. Among the stone objects unearthed by Mr Owen among the graves of Walpi were six painted stone slabs which were identified by the priests as the reredos of an ancient altar. Besides the work performed at Walpi, Mr Owen conducted excavations in three other small ruins; these yielded good results, as many specimens of great interest were recovered. Mr Owen also made many additions to the Hopi ethnological collection, especially masks, dolls, and a large number of specimens illustrating various phases of Hopi religion. With the addition of this summer's investigations among the ruins, the Museum will possess between seven and eight thousand pieces of prehistoric Hopi pottery, the majority of which are decorated with interesting symbolic figures.

Mention was made, in the former review of the department, of a collection which had been secured from the Wyman Brothers, consisting almost entirely of copper and stone implements representing the prehistoric archeology of Wisconsin. During the year an additional collection was obtained from these well-known collectors, comprising some three hundred specimens of copper and about a thousand stone implements from Wisconsin. Of the stone implements the most remarkable is a very large and beautiful stone axe, in good state of preservation, containing a number of parallel grooves running from end to end. The Museum was in possession of similar axes, but none of such size or interest as this one. The addition of the copper objects makes a total of about eight hundred from the Wisconsin region.

In addition to the copper and stone of the Wisconsin collection, there were six historic wampum belts, all well authenticated and of known origin, the best one being the so-called Oneida belt.

In May, Dr Phillips again volunteered his services to the department, and for the third time returned to the region of Mill Creek, southern Illinois, where he had been engaged in attempting the solution of the many problems presented in connection with the work of the department at this remarkable quarry. Dr Phillips concluded his work, reaching, it is believed, some interesting and important discoveries. He also visited and made sufficiently large and comprehensive collections from two quarries about thirty miles north of Mill Creek, as well as the great novaculite quarries near Hot Springs, Arkansas, where material was gathered to supplement that already in the Museum.

The months of August and September of last year were spent by the Curator in Europe, where he visited the museums of France and Italy and attended the Paris Exposition as a national delegate to the Congrès Internationale d' Ethnologie et d' Archéologie Préhistorique. He also visited the region of the megalithic monuments in Brittany and the Etruscan tombs of Corneto in Italy. In July of this year the Curator witnessed the Cheyenne Sun-dance ceremony, and, in August, the Mishongnovi and Walpi rites of the Snake and Antelope societies of the Hopi.

INSTALLATION

Within the present limits of the space at the command of the department, it is practically impossible longer to adhere to the geographical arrangement in the installation of the material in the various groups of peoples. The attempt is still made, however, to confine collections from definite geographic areas within single or adjoining halls. To retain this scheme necessitated great changes in the Edward E. Ayer Hall, the collections of which, during the year, have been entirely reinstalled in new cases and is now confined to the tribes of the Algonquian, Siouan, and Shoshonean stocks. The acquisition of the large amount of material from California necessitated the assignment of an entire hall to this region, but it has been found that even this space will not suffice.

The increase in the collections from the non-pueblo tribes of the Southwest also demanded that an entire hall be devoted to their exposition; consequently the two halls which formerly had been devoted to South America were vacated, one being assigned to California objects and the other to those from the non-pueblo tribes of the Southwest. It then became necessary to find space for the South American collections, and in connection with this necessity it is interesting to note a further advance in the department, which has for its object the simplification and unification of the department's aims. In my former paper I spoke of the abandonment of the collections occupying the so-called Columbus Memorial Halls for the reason that they did not appear to fall within the scope of anthropology. This left within the limits of the department three other halls, the contents of which also did not appear to come within the scope of the department, viz., two halls devoted to textile industries and one to ceramics. The textile halls were vacated and the exhibit abandoned, and in them were placed the ethnological collections from South America. The third large hall made vacant by the removal of the Columbus Memorial collections was occupied exclusively by the collections of prehistoric Hopi pottery.

The former office of the Curator was renovated, and in it has now been installed the collection of American games. The adjoining hall, formerly occupied by several large cases of musical instruments, was also vacated, the instruments having been returned to their proper places. This hall is now used for the temporary exposition of new or loan exhibits. A special room for this purpose has long been desired, and the facilities now offered for the immediate and temporary exposition of small collections is of obvious benefit.

The work of reinstallation of the collections devoted to the Northwest Coast, before referred to, has been completed, and they now occupy cases of uniform size, filling two halls. The classification and reinstallation was entirely by tribes. To one of the halls has been added a large group of seven figures made from life casts, representing the various house industries of one of the Salish tribes of Puget sound; while the other hall contains a large ceremonial group from the Kwakiutl Indians of Vancouver island.

Naturally in connection with the more important acquisitions during the last sixteen months, and in connection with the installation of the department, much work has been accomplished along various other lines, which has taxed to the utmost the resources of the staff. Certain phases of this work are not without interest, but lack of space does not allow mention of more than two incidents. The wonderful collection made by Mr Moorehead, for the World's Columbian Exposition, in the Hopewell group of earthworks in Ohio, is generally known to students of American anthropology, but the character and nature of many of the finds made by Mr Moorehead are not so familiar. This is due to the fact that an expert preparator has been working on these collections, chiefly the copper objects, during the greater part of the last two years, and, as a result, parts of many specimens have been assembled, so that it is now possible to determine accurately many forms not hitherto known. Such, for example, are three great copper eagles, large copper breastplates of unusual form, etc.

The other feature of the year's work in connection with incidental work of installation has been the preparation by Professor Tarbell, of the University of Chicago, of full and descriptive labels for the entire collection, in the great North Court, of objects illustrating the life of the Etruscans and Romans. This includes the Etruscan rock tombs, the contents of the trench and well tombs; the original bronze, glass, and mural decorations from Bosco Reale, and the Pompeiian and Herculanean reproductions. By the addition of these labels the value of these collections has been very greatly enhanced.

To characterize, in a word, the activities of the department during the last year and a half, it may be noted that special attention has been given to the acquisition of material from the tribes of North America hitherto imperfectly represented in the collections of the department. Having now reached a somewhat satisfactory condition in this regard, it is expected that in the future attention will be turned more and more to other parts of the world, which must be adequately represented if the department is to be of great general usefulness.

It is not too much to say that without the personal and always ready interest of the Director of the Museum, Mr F. J. V. Skiff, the amount of work which has been accomplished within the last sixteen months would not have been possible, and this opportunity is gladly taken by the writer to make public expression of his sense of appreciation of this interest.

BOOK REVIEWS

Report of the Cambridge Anthropological Expedition to Torres Straits. Vol. II, Physiology and Psychology; Part I, Introduction and Vision. Cambridge: University Press, 1901. 140 pp., 4°.

In the preface opening this most interesting monograph Dr A. C. Haddon explains the circumstances leading to the expedition which has resulted in this account, by Dr W. H. R. Rivers, of an exhaustive examination of the vision of the inhabitants of some of the islands in the archipelago lying in and contiguous to the straits between British New Guinea and Australia.

The people inhabiting these islands are very near a state of primitive culture. The inhabitants of Murray island, where most of the investigations were carried out, were, within thirty years, considered to be in a condition of savagery. Dr Haddon's previous visits to the island and his acquaintance with the people made it easier to get into the good graces of the natives and obtain their ready assistance and coöperation in the work.

The natives of the islands are considered to be pure Papuans; and these have been described as of "medium height, fleshy rather than muscular, of sooty brown color, darker than the Malay, frizzly hair, and retreating forehead." They are of the Negroid family, resembling the people of the eastern coast of Africa opposite Aden. They are sometimes called the oriental negroes. The population of Murray island is about 450 souls. Some of the inhabitants, particularly the younger, use a kind of "pidgin" English.

Physical characters and diseases of the eyes.—With few exceptions the conjunctival coat of the eye was pigmented, sometimes diffusely, but also occasionally in patches. In some of the older men there was a marked *arcus senilis* at the base of the cornea. Opacities of the cornea were common, as the result, no doubt, of former ulcerative inflammation. No mention is made of the presence of granular lids or *trachoma*, which is a cause of so much blindness and impaired sight among other peoples, such as the Irish, the Jews, the Russians, Italians, etc., but from which the Negro in this country seems to be immune. *Pterygium* and *pinguicula*, a thickening of the conjunctiva corresponding to the palpebral fissure, and most commonly on the nasal side, was very common. Two old men were affected with cataract. No case of strabismus or cross-eyes was observed. The pupils were usually very small and for the most part situated at the center of the iris; sometimes, however, slightly to the nasal side, never to the temporal side.

Visual acuteness.—Tradition has always accredited the savage with an unusual or even an extraordinary power of vision. Much of this is undoubtedly apocryphal, but there is scarcely a doubt that the average visual acuteness of man in a savage state is greater than in a higher condition of culture. Acute vision is necessary to his existence, and he has developed it accordingly.

The examinations were made by what is known as the letter (block) **E**, devised by Snellen, each line and space of which subtends an angle of one minute, which is the accepted lowest average visual angle for Europeans. The whole letter subtends an angle of five minutes. These letters are of various sizes and are numbered in accordance with the distance at which they subtend this angle, as No. 5, five meters, No. 10, ten meters, etc.; $\frac{5}{5}$, $\frac{10}{10}$, etc., being normal vision for the average European in an average illumination within doors. This is the simplest and most easily applied method, and is to be commended to investigators on this account and because it is comparable directly with the results obtained by the methods employed by oculists everywhere.

In making the test, a card with a series of these letters, of various sizes, numbered according to the distance at which they subtend an angle of five minutes, and with the open side pointing in various directions, is placed before the person under examination. In his hand he holds a card on which there is one of these figures, and he is required to turn the card so that the direction of the open side of the letter shall correspond to that of the letter indicated by the examiner on the test card.

Coming now to results, we find that the average visual acuteness of the Murray islander (115) was $\frac{10.3}{5}$; that of the Mabiug islander (36), $\frac{11.6}{5}$; that of the Kiwai islander (19), $\frac{10.3}{5}$. Comparing these with the visual acuteness of the Heligolanders, a European people living mostly out of doors, we find that the latter has an average of only $\frac{10.3}{5}$. The picked men of the German army and navy have an average of $\frac{10.6}{5}$, slightly higher than the Murray islander. Several cases of $\frac{20}{5}$ were observed among the islanders.

Refraction of the eye.—The eyes of infants are nearly always hypermetropic, and the same condition is supposed to prevail largely among savages. Quite a large percentage of this form of refraction defect was found among the islanders, though not to such a degree as to impair their distant vision. No considerable degree of myopia, or short-sightedness, was observed among the Papuans. It can be said that, taking the same number of Europeans as they come, there would be found many cases of myopia and other refractive defects. There can be no doubt that bad vision from faulty refraction of the eye is a price we are paying for our higher civilization.

It is interesting as showing how highly the sense of sight is developed among these savages that the threshold for light and form—that is, the faintest illumination perceivable—is lower than in the cultivated man. It was also demonstrated that the adaptation of the eyes to changes from light to darkness was quicker than in the European. The author is disposed to connect these phenomena somewhat with the heavy pigmentation of the fundus of the eye in the dark races. It is a matter worthy of further investigation. The capacity to distinguish differences in brightness, as shown by a Masson's wheel, is quite as pronounced among the Papuans as among the Europeans thus tested.

In all these investigations it was especially apparent that the savage was quite as capable, or even more so, than the average European of concentrating his attention on the specific thing being done, and the author is disposed to attribute this to the absence in a greater or less degree of esthetic sense on the part of the savage who is not led away by abstract considerations and holds his attention entirely on the concrete.

Color vision.—The investigation of color vision was very thorough and the results valuable as tending to establish more certain opinions in regard to the development of the color sense. If space allowed, we should be glad to go into an exhaustive consideration of this important branch of the subject. We shall have to content ourselves, however, with a bare outline of the results obtained. The matching of Holmgren's worsteds was the method principally employed. There may be defects in this method, but it still remains the best for an examination of a large number of people as to the general sense of color perception. There is no doubt in the mind of the author that these islanders with few exceptions perfectly comprehended what was required of them in the matching.

Among 280 natives (152 men) examined there was no case of red-green blindness found. Among Europeans four per cent. of the male population are affected with this form of color-blindness. It is worthy of mention, however, that among eight men from Lifu, of the Loyalty group of islands, three were found distinctly affected with red-green blindness. On this basis, the hint is thrown out that the color-sense might be used as a means of distinguishing one race or branch from another. The really important discovery, however, was an evident weakness of perception of blue, if not a clearly-defined yellow-blue blindness, in quite a number, a form of color-blindness exceedingly rare in Europeans. All the experiments with colors seemed to show a difficulty with the blue end of the spectrum. This is also borne out by the color nomenclature (about which much is recorded in the monograph), for while there are several distinct names for red, there is no separate name for blue, the word for black often being employed for that color. Neither have they a separate word for brown; the words for red, yellow, gray, or black being used, and having reference mostly to its degree of saturation. These facts lend some plausibility to the theories of Gladstone and Geiser as to the development of the color sense. They probably have no abstract name for color, the names of the separate colors being nearly always the name of some specific well-known object of that color, as for instances, *mam* (blood) for red, *siu* (yellow ocher) for yellow, *lulam* (leaf) for green, etc. It is curious that no color is named for a flower, a custom so prevalent among the European races. The Papuan seems to have a very low threshold for red,—lower, perhaps, than the average European, while that for blue is very high. On the other hand it was revealed that blue was perceived normally in peripheral vision,—though the visual field as a whole seemed more contracted than in the average European. Contrast colors were readily perceived, as well as the color after-images, with the exception of blue, about which some were uncertain. Among color preferences red ranks the highest; green, blue, and violet being rarely chosen.

Experiments in *visual space perception*, such as estimation of length of line, bisection of lines, division of lines into three or more equal parts, estimation of vertical and horizontal lines, the Mueller-Leyer illusion, and other visual illusions, were all carried out with the same painstaking care as has marked all the other work done, and showed that, on the whole, the savages were not very far, if any, behind their European brothers in visual capacities in their broadest meaning.

Too much cannot be said in praise of the thoroughly scientific manner in which these investigations have been made, or the honesty and carefulness of their recording. The existing literature on the subject seems to have been exhausted and the bibliography is full and complete. All future work along this line can well accept this monograph as a basis, accurate and reliable. SWAN M. BURNETT.

The Ethno-botany of the Coahuilla Indians of Southern California. By DAVID PRESCOTT BARROWS. Chicago: The University of Chicago Press, 1900. 82 pp. 8°.

This memoir was submitted to the faculties of the graduate schools of arts, literature, and science, department of anthropology, University of Chicago, for the degree of doctor of philosophy. It is a well written, plainly stated study, treating the following subjects in eight successive chapters : Linguistic and tribal affinities of the Coahuilla Indians ; the habitat of the Coahuilla ; houses and house-building ; baskets and basket-making ; plant-materials used in manufactures and arts ; the gathering, preparation, and storing of foods ; food-plants of the Coahuilla Indians ; drinks, narcotics, and medicines.

Dr Barrows suggests, with much good reason, that the term "Coahuilla linguistic family" be henceforth employed to designate the great Shoshonean group of the Amerinds which occupies southern California. His reasons are as follow : The Coahuilla were and still are the most powerful and best known of all the tribes in southern California ; they are also the only ones who preserve in common use their own designation for themselves—it being the word proposed, commonly pronounced by the tribesmen "Kow-weé-yah"—; with the exception of the Luiseños, the Coahuilla are the only body of these southern California people still a nation.

In presenting a picture of the habitat of this tribe, Dr Barrows calls attention to the peculiar life of the desert, following quite closely Dr W J McGee's paper on "The Beginnings of Agriculture."

The vegetal resources of this semi-arid habitat are indeed many. Dr Barrows discovered not fewer than sixty distinct products for nutrition, and at least twenty-eight for narcotics, stimulants, and medicines. Of this habitat the author says that, dreary and forbidding as it appears, it is, after all, a generous one. "It bears some of the most remarkable food plants of any continent. Nature did not pour out her gifts lavishly here, but the patient toiler and wise seeker she rewarded well. The main staples of diet were, indeed, furnished in most lavish abundance. . . . I have seen the mesquite beans fallen so heavily beneath the trees in the vicinity of Martinez as to carpet the sand for miles. Centals could be gathered about every tree. Hundreds of horses and cattle that ranged the valley, to say nothing of the busy women that had crowded their granaries full, effected no visible diminution of the supply. . . . A single canyon often contains enough ["chamish" (*Prunus Andersonii*)] to supply an entire village of meal of pounded pits. Within the habitat of the Coahuillas scores of such canyons could be found."

He says that the native dwellings, jacals, are made by the men. This fact is striking, because women are the usual builders of similar temporary dwellings in America. It may be that the Coahuilla imitated neighboring sedentary people in house-building, as Dr Barrows says they borrowed many another tribal activity.

The author speaks of the Coahuillan native wells as perhaps unique among the aboriginal tribes of America. They are often deep and broad funnels in the plains, at the bottom of which lies the water. The sloping sides of these funnels are so gradual that the women descend and ascend, carrying their ollas easily on their heads. Dr J. Walter Fewkes tells me that the Hopi have a few wells similar in construction to those mentioned by Dr Barrows. For instance, the "Katcin-ba" or Kachina spring, five miles from Walpi, is of this construction, excepting that the water is confined by a low stone wall. However, it is not known that the Hopi dug this well originally; it is possible, as is the case of other wells among them, that it was a small spring improved by the tribe.

Dr Barrows says that the culture of the Coahuilla was a developing barbarism, and it is folly to insist that it would have made, of itself, no further advances. Yet they have been steadily decreasing for several generations, and the end of this interesting people is already in sight.

The study by Dr Barrows is in many particulars an excellent one; the chief criticism offered is that, being in every way worthy of an index, the memoir should have had one.

ALBERT ERNEST JENKS.

The Structure of the Koko-Yimidir Language. By WALTER E. ROTH, B.A., etc., the Northern Protector of Aboriginals, Queensland, with the assistance of Revs. G. H. SCHWARTZ and W. POLAND, Lutheran Missionaries at Cape Bedford Mission Station. (North Queensland Ethnography: Bulletin No. 2, April, 1901.) Brisbane: Government Printer, 1901. 35 pp., 4°.

The Koko-Yimidir language (*koko*, "speech," *ydimir*, "the same, similar") is spoken along the coast-line extending from the Annan and Endeavor rivers to the northern side of Cape Flattery, although it is understood considerably beyond these limits, and is of more than usual interest, because a vocabulary of this tongue was taken down in 1770 by Lieutenant Cook, on his visit to Endeavor river. The data of this monograph are arranged under the following heads: Naming of things in general, names of parts of the human body, names of the human body as a whole, names of objective and subjective sensations, names of family relationships, names of persons, names of animals, names of plants, names of inanimate nature, names of manufactured articles, gender, dual and plural, case, personal pronouns, relative pronouns, definite pronouns, interrogative pronouns, qualifying suffix of nouns and pronouns, verbs, active verbs, reflexive verbs, defective and irregular verbs, adjectives, qualification of adjectives, adverbs, conjunctions, prepositions (a comprehensive section), interrogation (doubt, uncertainty), composition (five more or less extended extracts from letters written to Mr Roth by a young aboriginal woman of the Cape Bedford Mission Station), etc. These pages contain a mass of interesting and valuable information for the psychologist, no less than for the linguistic specialist.

The vocabulary of Lieutenant Cook and the modern Koko-Yimidir are given in parallel columns at pages 6–7, and the comparison gives no support to the theory of the rapid change of savage tongues; indeed, quite the contrary seems the case here. Nor do the data sustain the position of those who deny to such speech the possession of abstract terms, for the author enumerates a score of these, including *daku*, "anything in general (animate or inanimate)", which is surely generic enough. As the author occasionally notes, there are surprisingly many coincidences in figurative and derivative sematology between this Australian dialect and modern English. A certain permanence of family-names may be indicated by the fact reported on page 11: "When on the Endeavor river in 1770, Lieutenant Cook describes the name of one of the natives as Yaparico. This family name still exists, under the guise of Yaborego, and is derived from a particular spot in the neighborhood of Cape Flattery." If the word *ganguru*, given as one of the names for a species of kangaroo, is a real aboriginal term, the author's identification of it with *ganguru*, "big toe, thumb," in the Koko-Yimidir (compare the scientific *Macropus*) would offer something more satisfactory than the etymology of this word given in the dictionaries. Special studies like this must increase the interest of comparative philologists in the Australian dialects, which afford so much valuable material for the investigation of primitive speech, and yet, by the striking analogies of thought they offer with languages so far advanced as the English of today, testify to the essential unity of the human mind, apart from century, clime, or race.

ALEXANDER F. CHAMBERLAIN.

Government Museum, Madras. Catalogue of the Prehistoric Antiquities. By R. BRUCE FOOTE, F.G.S., etc. Madras: Printed by the Superintendent, Government Press, 1901. xix, 131 pp.; 35 plates.

Pages iii–xix of this Catalogue are devoted to an interesting preface by Professor Foote, the rest being occupied by a briefly descriptive list of more than fourteen hundred specimens (implements, pottery, earthenware; objects, beads, ornaments, and implements of bronze, iron, gold, etc.), of which some twelve hundred belong to the Iron age, the neolithic and paleolithic series being comparatively limited in numbers. Although implements and ornaments of bronze, brass, and copper have been sparsely found, it has not been under conditions clearly antecedent to the Iron age, so "the existence of a distinct Bronze or Copper age may, for the present, be regarded as quite problematic for South India" (page iv). Between paleolithic and neolithic man (not so much in South as in Western India, however) "geological evidence indicates that a great gap, historically speaking, exists." But the Iron age, as the study of prehistoric dwelling sites in the Deccan shows, seems to be the direct descendant of the neolithic. The gem of the collections in the Madras Museum is that of Mr J. W. Breeks from the cairns and barrows of the Nilgiri hills; it is, however, deficient in pottery from the neolithic villages of the southern Deccan. Of the earthenware figures Professor Foote observes (page ix): "Certainly many animals, which one might have expected to see modeled, are unrepresented. Except the peacock, none of the birds which figure so largely in the later Hindu mythological sculptures occurs among the clay figurines. There are no hawks, eagles, vultures, parrots, or swans, nor any lizards, tortoises, or fish, all of which are so frequently to be seen as carved decorations symbolical or commemorative of later times." Nor is there any resemblance between the costumes and arms of the people represented by the figurines and "those of the folks figured on the carved slabs of the kistvaens and cromlechs at Sholur, Melur, etc., in Mr Breeks' *Primitive Tribes*." The prehistoric pottery of South India is not glazed, as is often mistakenly stated, the typical shining surface having been "produced by friction of the surface prepared with a vegetal juice [*Abutilon Indicum*] such as is now used in the preparation of some varieties of modern Indian pottery" (page xvi). The almost entire absence in the Indian pottery types of handles and spouts may be a result of the inferior quality of clay used and the insufficient preparation, firing, etc. In the decorations imitations of the forms of animals and plants are absent except in the Nilgiri pottery, and there only on the lids, where they are not drawn but "built up independently and luted on to the surface." Moreover, "no symbolical figures or markings, made on the vessels before firing, are to be seen, but subsequently to the firing, and probably while in use, a small number of them were marked with scratches made with a hard, sharp-pointed instrument of some kind [property-marks?]." These property-marks are figured on plate xxxv. No. 1124 looks as if it might have been intended for a swastika.

ALEXANDER F. CHAMBERLAIN.

The Symphony of Life. By HENRY WOOD. Boston: Lee & Shepard, 1901. Pages 3–302, 12°.

This book is an excellent example of evangelical exegesis of a modern and healthful type. The author is a well-known writer on philosophic topics; and in this latest product he enters temperately and judiciously into that broad field of thought bounded on the one hand by the time-honored ways of faith and flanked on the other hand by the straight-laid paths of modern science. Conservative enough on the whole, he is notably tolerant of the facts discovered and established through exact observation and precise reasoning, and indeed recognizes fully the ultimate necessity of adjusting standards of thought and feeling to the verities of experience. The book is not for the specialist in anthropology, save in relaxation or as a means of adjustment to the more intuitive humanities toward which research is steadily advancing: yet as a stepping-stone toward the science it is well adapted to widespread habits of thought. W J MCGEE.

Researches in the Central Portion of the Usumatsintla Valley. By TEOBERT MALER. Memoirs of the Peabody Museum, Harvard University, Vol. II, No. 1. Salem, 1901. 75 pp., 33 plates, 26 figures, 4°.

Any work which adds to our knowledge of the prehistoric times of our continent is a welcome visitor, but more especially one which, like the memoir named above, brings us something additional in regard to the remains of the Mayas of Central America, who, by their self progress, had made the nearest approach to civilization of any native people of America.

The large amount of material collected by the recent explorations in Central America, and the advance made toward the interpretation of the inscriptions, have, while throwing new light on the mystery of the Mayan ruins, also brought forward new problems to be solved, hence the earnest desire for additional data bearing on these problems. Mr Maler's paper is a real contribution in this respect, as it furnishes not only descriptions of ruins hitherto undescribed, but also photographic copies of additional inscriptions and figures. Fortunately he has also presented with his paper a map of the region over which his explorations extended, by which we are enabled to locate definitely the ruins mentioned,—a most important aid in the study of tribal differences in culture.

The region over which these explorations extended appears to be embraced in that part of Usumasinta valley (or Usumasintla, as he writes it) from Tenosique on the north, up (southward) to Menche (Charnay's "Lorillard City," or Yaxchilan as Maler gives it, if I interpret his map correctly). The ruins described are those at La Reforma, Chinikihá, Chancala, Xupá, and Piedras Negras, the chief portion of his paper being devoted to a description of those at the latter point.

La Reforma is situated almost directly east of Palenque, on Chacamax river, about two-thirds the distance from Palenque to Usumasinta river. There is but brief mention of the ruins in the vicinity of this village, unaccompanied by figures.

Chinikihá[1] is the name of some ruins on Chinikihá river, a few leagues almost directly south of Reforma. Although evidence was discovered here of several structures of considerable size, they were found to be in such a ruinous state that but little could be ascertained in regard to their plans. The terraced pyramid surmounted by a temple was the prevailing form; the latter, however, in such a ruinous condition that in one instance only could indications of rooms be discovered. "We first explored," says the author, "all the remains on the right of the road, but found nothing but remnants of walls and terraces, with the exception that in one building we found small rear rooms in a half-preserved condition; everything else was completely in ruins." The most important discovery was an altar slab, though not in its original position. On the top of this were parts of two rows of *incised* glyphs, which are figured; on the edges were also bands of glyphs of which photographs are given; the latter were in the usual low relief. All are of the usual type.

Chancala.—This is the name given a group of ruins lying directly west of Chinikihá, and on Chancala river. Here, as the author states, he was "successful in discovering a temple in a fairly good state of preservation, which crowned a small pyramid of six terraces." This, as appears from the figure, is of the small, rectangular, single-room type. The means of ascent was by two flights of stairs on one side—one to a platform extending out from the third terrace, the other from that point to the top. The broad frieze, instead of being perpendicular, sloped inward toward the flat top.

Xupá.—This group of ruins is situated a little north of west from Chancala, and about an equal distance, a little east of south, from Palenque. Of this group Mr Maler says: "The ruins are situated on the right bank of the Xupá and are of considerable extent. Nearly all of the buildings appear to have had great substructures built of good hewn stone. The superstructures are almost without exception in ruins, but in all directions there are massive substructures, many of which are of considerable size." However, his search for sculptured stones appears to have been almost without material result. "The principal temple, once a noble edifice crowning a large pyramidal substructure, alone exhibits parts of rooms and remains of walls." He speaks of the close resemblance of this temple to those at Palenque. On a detached slab he discovered the only sculpture worth copying; this, a fine female form highly ornamented with skirt reaching to the feet, is almost exactly similar in its ornamentation to one or two found at Palenque.

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[1] Mr Maler gives *tš* as representing the sound of *ch*.

Piedras Negras.—It was at this point, situated on the right bank of the Usumasinta, just within the Guatemalan boundary, that Mr Maler made his chief discoveries. I will give only a summary of results, as an attempt to particularize would extend this notice of his paper to too great a length. He found no fewer than thirty-seven stelæ, twenty-three of which were photographed, fourteen being too much injured to render this of any use. These, when in position, or at the places where they had been erected, though now overturned and sometimes broken, were usually on the upper terrace of a pyramid in front of the temple which stood upon it. These varied in height from 200 to 400 cm. Six lintels and five altars were examined, some of the former bearing the most important sculptures discovered. Some ten or eleven structures, or so-called temples, are more or less fully described. Large photographic illustrations of twelve inscriptions are given. The more important of these for study are those on Stela 1, Stela 3, Stela 36, and Lintel 2. The sculpture on the last, which covers a double plate of the large quarto, represents the most interesting scene of the entire series, and reminds one of some of the scenes sculptured on the Assyrian temples. Six elaborately costumed warriors, with high, cap-shaped helmets (each helmet crowned with a spreading brush of feathers), and each on bended knees holding in his right hand a lance, face the ruler or chieftain of lofty stature who stands before them with a spear in his right hand, shield on his left, and head profusely decorated with feather ornaments. On the left margin is a column of large double glyphs—an initial series; over the heads of the kneeling warriors are four lines of glyphs, and over the heads of the chief and aid, who stands behind him, two lines; and on the right margin two columns.

One important fact mentioned is the repeated evidences of coloring remaining on the sculptures; for example, of Stela 2 Mr Maler says: "Remnants of color were still visible, as follows: face, arms, and garment, bright red; background, dark red; edge of garment, blue;

breast-cape, blue; feathers always green." Looking at his photographs of the stelæ, and imagining these colors applied, we can obtain some idea of the brilliant effect, at least to the native eye.

Another unusual feature observed here is the plaited turban. However, the most important facts bearing on the progress of art and the geographical direction of its advance are found in the presence here of numerous stelæ and the very close similarity in the forms of the glyphs at Piedras Negras and those at Palenque. In fact there appears to be a greater difference between the sculptures (glyphs and figures) at Piedras Negras and those at Menche as given by Charnay, than those at the former place and Palenque. Was Piedras Negras the intermediate point between Palenque and Copan? A critical study of the data now available may be sufficient to give a probable answer to this inquiry. The studies of historians and linguists appear to be gradually leading to the conclusion that the Chol and Chorti groups (supposed authors of the Copan and Quirigua structures) are not only more nearly related to the Tzental group than to any other of the Mayan divisions, but formerly had their chief home on the Usumasinta where a small remnant of the Chol tribe is still found.

I have not as yet had opportunity to study the inscriptions carefully, but the inscription on Stela 36 is so distinct, and the numerals in the ordinary form, that but little study is necessary to determine the initial series. This, using Goodman's nomenclature, is as follows:

9 cycles = 1,296,000 days.
10 katuns = 72,000 days.
6 ahaus = 2,160 days.
5 chuens (months) = 100 days.
9 days = 9 days.
Total 1,370,269 days.

This number of days, counting from the normal date 4 Ahau, 8 Cumhu, year 8 Ben, will bring us to the day 8 Muluc, 2 Zip, year 6 Lamat. This corresponds with the numbers of the day and month glyphs which follow; the month date, however, stands some distance below the day glyph.

I have referred to this inscription simply to show that the normal date used as the era in so many other inscriptions was the one in use here. The 9 cycles so common elsewhere are also found in this inscription, which, if Seler and Mr Bowditch be correct in their supposition, will show the date of the inscription, or age in which it was made, to be substantially the same as that of most of the other Mayan inscriptions which have been discovered.

The plan of the group of ruins at Piedras Negras, as given by Mr Maler in his plate XXXIII, is worthy of careful study, as it reveals the fact that in two or three instances the hill-side was selected as the building point, thus doing away with the necessity for terraces in the rear.

It may be observed by his map that the author identifies Palenque as one of the points visited by Cortés on his trip to Honduras. I believe, notwithstanding the almost universal opinion to the contrary, that he is correct in this conclusion.

It is to be hoped that the Peabody Museum will continue its explorations in the same section, as it is evident from the number of undescribed ruins Mr Maler locates on his map, that the field is far from being exhausted. CYRUS THOMAS.

PERIODICAL LITERATURE

CONDUCTED BY DR ALEXANDER F. CHAMBERLAIN

GENERAL

Anthony (R.) Notes sur la morphogénie du sternum chez les mammifères à propos de l'étude de Paterson sur le développement de cet os. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1901, v^e s., II, 19–43.) After a brief *résumé* of Paterson's article on the sternum in the *Journal of Anatomy and Physiology* for 1900, the author discusses somewhat in detail the following topics : Choice of the level at which to measure the width and the thickness of the sternum to obtain its indices ; the regression of the sternum in its posterior portion in the mammals below man and in man himself. The sternum is a part of the skeleton in which regression (posteriorly) is rapidly taking place.

Bloch (A.) De la transformation d'une race dolichocéphale en une race brachycéphale et vice versa. (Ibid., 73–83.) The author, who at the Congress of 1897 maintained that the transformation of a dolichocephalic into a brachycephalic race had occurred with some of the ancient peoples of Russia (as represented by the remains in the *kurgans*), and at the Congress of 1900 sought to show that the neolithic brachycephals of France were descended directly from the dolichocephals of the same epoch without the intervention of a foreign race, discusses here these questions with respect to a living race (the modern Japanese) and an extinct one (peoples of the *kurgans* and the Reihengräber), using for the former the researches of Koganei and Baelz, and for the latter those of Bogdanov, Ranke, etc. The transformation of a part of the brachycephalic Japanese into a finer (dolichocephalic) type, is not, the author thinks, the result of European contact, since the two varieties existed even in the 17th century. The large percentage (14.3) of occurrence of the metopic suture among the Japanese is thought to be characteristic of a race that is in process of modification. The influence of *milieu*, perhaps, counts for a good deal more than that of civilization.

Bolton (R. P.) Some traditional misconceptions of law. (Journ. Amer. Folk-Lore, Boston, 1901, XIV, 115–117.) Gives examples, chiefly from London, of so-called legal enactments which exist only in the imagination of the folk.

Chamberlain (A. F.) Some recent anthropometric studies. (Pedag. Sem., Worcester, 1901, VIII, 239–257.) Critical *résumé* with bibliography of investigations by Matiegka (Prague), Vossiljef and Vorobjef (Moscow), Schmid-Monnard (Halle), Pfitzner (Alsace), Wateff (Bulgaria), Rossi (Siena, Italy), Bellei (Bologna), Simon (Seine, France), Douchez (Vierzon, France), Lee and Pearson (England), Gray and Tocher (Aberdeenshire), Christopher and Smedley (Chicago), Reik (Maryland), Beyer and Johnson (Massachusetts), Hastings (Lincoln, Omaha, Neb.), Major (N. Y.).

Coraini (E.) L'articolazione bigemina del bregma comparativamente studiata negli animali attuali. (Atti d. Soc. Rom. di Antrop., 1901, VII, 49–66.) Treats of the bigeminal articulation of *bregma* as observed in 218 animal crania in various Italian museums. Dr Coraini finds that, in animals, as well as in man, the most common articulation is the fronto-parietal-sinistral, which is, however, much less common in animals than in man. The frontal-parietal-dextral articulation may have a phylogenetic significance.

Duckworth (W. L. H.) Bericht über einen Fötus von Gorilla savagei. (Arch. f. Anthr., Brnschwg., 1901, XXVII, 233–238.) Describes, with 5 text-figures

Duckworth—*Continued.*
and table of measurements, a gorilla-fœtus in the zoölogical collection at Cambridge, Eng., and compares it with the human fœtus and with the gorilla fœtus described by Deniker. Ontogenetically, the characteristic external peculiarities are recognizable in the fœtus at a very early stage, and the earlier they appear the more importance is to be attached to them. The author concludes that "the stock of the anthropoids, as we know them today, must have branched off from the ancestors of man at a correspondingly early epoch."

d'Enjoy (P.) L'hospitalité à travers les âges. (Rev. Scientif., Paris, 1901, 4e s., xvi, 143–148.) General discussion of laws of hospitality among the Romans, the peoples of the Orient, India, China, etc. The development is from the savage *homo homini lupus* to open hospitality.

Garnault (P.) Sur la possibilité des idées hygiéniques dans la haute antiquité. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1901, Ve s., ii, 105–110.) According to M. Garnault, whose paper was suggested by Dr Loir's recent study of circumcision, "the idea of hygiene is absolutely modern," the result of the immense increase of our ideas about the causes of special phenomena, and of our classificatory system of these phenomena. In antiquity hygienic ideas would have been largely impious. Religion, not hygiene, is at the basis of the idea of circumcision. The author might have remembered that "cleanliness is *next to* godliness."

Garson (J. G.) A system of classification of finger-prints. (Journ. Anthrop. Inst., Lond., 1900, xxx, misc., 105–106.) By graphic representations of the ridge-patterns in the impression of a finger, ten classificatory divisions are obtained, from which further decimal subdivisions may arise, running as high as 2,430.

Giglioli (E. H.) Appunti etnologici presi a Parigi nell' estate 1900, all' esposizione e fuori. (Arch. p. l'Antrop., Firenze, 1901, xxx, 239–251.) General notes of ethnology at the Paris Exposition of 1900 and elsewhere in the city,—the Museum at the Jardin des Plantes, the Archeological Museum of St Germain-en-Laye, etc.

Giuffrida-Ruggeri (V.) Sul significato delle ossa fontanellari e dei forami parietali e sulla pretesa penuria ossea del cranio umano. (Atti d. Soc. Rom. di Antrop., 1901, vii, 81–92.) After discussing briefly the previous studies of Papillault, Ardù-Onnis, Hovelacque, Maggi, etc., the author gives the results of the examination for fontanelle and wormian bones in 30 pentagonoid and 30 ellipsoid Roman skulls (all males), and for parietal foramina in a large number of delinquents, epileptics, idiots, and lunatics in general. He believes that the parietal foramina are remnants of fontanelles. Parietal foramina are more common in pentagonoid than ellipsoid skulls; more frequent in the "lower" races and in women. Fontanelle bones are not *per se* abnormal or pathological, but have a morphological signification. They do not arise from lack of osseous material, but are rather the equivalent, or the continuation of a non-adult condition.

Guyot (I.) Discours du président sortant. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1901, Ve s., ii, 1–7.) *Résumé* of labors of the Society and its members during 1900.

Kidd (W.) Hair on the digits of man. (Nature, Lond., 1901, lxiv, 351.) General remarks, with note of hair-distribution on digits of baby four-and-a-half years of age. The author has since published a more extended treatise on the subject.

Lasch (R.) Die Verbleibsorte der Seelen der im Wochenbette Gestorbenen. (Globus, Brnschwg., 1901, lxxx, 108–113.) An extended account, with many references to literature, of folk-thought all over the globe concerning the abiding-place of the souls of women who have died in child-bed. The "reward" of the dead in child-bed among primitive races is only another side (or stage) of the respect still shown in civilized Europe to the same person. The latter, however, evinces a sense of duty hardly present in its moral significance with the former.

Lenz (R.) Ueber Ursprung und Entwicklung der Sprache. Mit besonderer Berücksichtigung von Jespersens *Progress in Language*. (Die Neueren Sprachen, Marburg, 1901, viii, 449–472, 513–534, 577–589; ix, 1–12.) One of the most valuable of recent es-

Lenz—*Continued.*
says on the origin and development of human speech, with special reference to the evolution of the English language. The author's acquaintance with American aboriginal tongues (Araucanian in particular), his study of the contact of Spanish and Araucanian in Chile, and his observation of the linguistic development of the children of German, French, and English settlers in South America, give weight to his opinions and conclusions. The comparison (455–466) of Spanish, French, English, and German as to phonetic, grammatical, and syntactic difficulty is very suggestive for child-learners. Certain facts would seem to indicate that there does not always exist an innate disposition for the speech of the parents in the child. Dr Lenz does not hesitate to point out the insufficiency of the Müller-Schleicher theories that have so long dominated comparative philology. He points out also how the overestimation of the classical tongues and the "deification" of Sanskrit has hindered appreciation of the modern languages, to say nothing of the languages of primitive people from which we are now beginning to learn so much. A good deal, *e. g.*, is to be expected from a thorough-going comparative study of English and Chinese, the two most advanced languages (psychologically) existing in the world today. The idea of the evolution of language is given by Gabelentz in the form of a spiral, by Hermann Müller by a circle,—the former is the more correct symbol, Dr Lenz thinks, because languages in the process of their development never return to quite the same point. The sources of inflection are to be found in an earlier agglutination, and the process of development from polysynthetism through agglutination and inflection to isolation is harmonious and corresponds to a species of psychological development. The language of children helps us out here. A distinction is to be made between the period of linguistic development of a general sort and the period of special evolution represented by the progress *per se* of a special linguistic tendency or form. The formation of words no *one* theory can explain.

Manouvrier (L.) La protection des antiques sépulchres et des gisements préhistoriques. (Rev. de l' École d' Anthrop. de Paris, 1901, XI, 229–250.) General statement of the need for the protection of ancient burial-places, prehistoric deposits, etc. The author believes that the scientific societies, having responsibilities greater than those of single investigators, can do much. He also thinks an appeal to public opinion of some value. One of the things to be got rid of is the collector of a speciality, who to add one more flint to his case will trample to pieces any number of skeletons.

Mantegazza (P.) L' insegnamento dell' antropologia. (Arch. p. l'Antrop., Firenze, 1900, XXX, 261–267.) Brief history of the Chair of Anthropology at Florence, with notes on anthropology as a subject of instruction, and an open letter from Mantegazza to the Italian Minister of Public Instruction asking that in those universities where chairs of anthropology exist the subject be made obligatory.

—— Prime linee di psicologia positiva. (Ibid., 269–276.) *Résumé* of lectures on comparative psychology. The first part, "method and materials," is here presented.

Mantia (P.) Il genio e la nevrosi. (Atti d. Soc. Rom. di Antrop., 1901, VIII, 44–46.) Brief critique of current theories as to the relationship of genius and neurosis.

Moore (*Mrs* K. C.) Comparative observations on the development of movements. (Pedag. Sem., Worcester, 1901, VIII, 231–238.) Detail in parallel columns of the development of eye, head, body, and limb movements in a boy and a girl in the early months of life. Among the interesting results noted is that "the boy seemed to acquire a movement at the cost of a greater number of efforts than the girl did."

von Negelein (J.) Die volksthümliche Bedeutung der weissen Farbe. (Ztschr. f. Ethnol., Berlin, 1901, XXXIII, 53–85.) A detailed discussion, with a plentitude of references to literature, of the color white in folk-thought. Among the topics touched upon are: Albinism and varieties, "white women and men" in religion and mythology, the Teutonic "white horse" and its analogues, etc. According to the author albinism as a rare phenomenon in nature has induced astonishment, wonder, and fear, the

von Negelein—*Continued.*
foundations of all religious adoration; by reason of its seeming relations to sunlight and phosphorescent phenomena white color has led to the identification of albinos with celestial bodies and the lightning, and to the selection of white animals as fire-bringers; its resemblance to the pallor of corpses and certain skin-diseases has set up other lines of thought; later on its presence in objects known to be harmless led to an appreciation of these. So white comes to be the color of innocence and knowledge.

—— Seele als Vogel. (Globus, Brnschwg., 1901, LXXIX, 357–361, 381–384.) An interesting study, with numerous references to literature, of the idea of the soul as a bird among various peoples, ancient and modern. Among the causes contributing to the selection of the bird as a symbol of the soul are the mystery of its egg-origin, flight, cry, night-life of some birds, etc. Swan-maidens, egg-laying nymphs, bird-witches, bat-girls, the Egyptian bird-soul, the Greek Psyche, the traveling bird-soul of the Slavs and other peoples, and the like are referred to.

Nystrom (A.) Ueber die Formen-veränderungen des menschlichen Schädels und deren Ursachen. Ein Beitrag zur Rassenlehre. (Arch. f. Anthr., Brnschwg., 1901, XXVII, 211–231.) Discusses, with 11 figures, the following among other topics: Craniology and race, static law of brachycephaly, dynamic law of dolichocephaly, equilibrium of the head, heredity. The influence of muscle-use in shaping the skull is emphasized and its relation to brachycephaly and dolichocephaly indicated, and cranial measurements (of children especially) to this effect are given. There is figured also a cranial dilater for showing the influence of inner pressure on the form of skull. Muscular influence of this kind is best noted in young savages. The author considers mesaticephaly as much "a chief type" as brachycephaly or dolichocephaly, and from a study of 84 brothers and sisters, comes to the conclusion that cranial heredity is relative rather than absolute, and that each "type" tends to be inherited.

Papillault (G.) Suture et fontanelle métopiques. (Rev. de l'École d'Anthrop. de Paris, 1901, XI, 227–228.) Critical review of recent literature (Maggi, Schwalbe, *et al.*) on the metopic suture and fontanelle.

Pelletier (Madeleine). Sur un nouveau procédé pour obtenir l'indice cubique du crâne. (Bull. et Mém. Soc. d' Anthrop. de Paris, 1901, V^e s., II, 188–193.) After a brief discussion of other methods in use, the author advocates the substitution of the metopic diameter for the maximum glabellar antero-posterior diameter, and of the auriculo-bregmatic height for the basilo-bregmatic diameter, in finding the "cubic index" of the skull,—this can be done on the living subject, which is a great advantage. Proceeding otherwise according to Broca, the "cubic index" of 67 male and 39 female Japanese skulls was found to be 1.01 and 0.97 respectively.

Peyton (*Rev.* W. W.) Anthropology and the evolution of religion. (Contemp. Rev., Lond., 1901, 213–230.) An endeavor to show how "anthropology has misspelt and misread the facts it has dredged up." Treats of spirit of nature, ghosts, feeling after God, poetic faculty, etc.

Read (C. H.) Presidential address. (Journ. Anthrop. Inst., Lond., 1901, XXXI, 9–19.) Notes a marked advance in the recognition of anthropology during the last year, and advocates its more definite recognition in the great teaching centers.

Regnault (F.) Variations de l' indice céphalique sous l'influence du milieu. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1901, V^e s., II, 147–157.) From the observation of pathological cases, wild and domestic animals, etc., the author concludes that the muscles of the nape of the neck exercise considerable influence upon the form of the skull,—powerful muscles lengthening it while brachycephaly results from weak muscles of this region. The law of correlative variations also accounts for skull form,—long limbs, long trunk, long head; short limbs, short body, short head. Continued influence of mountain milieu, Dr Regnault thinks, could change dolichocephalic into brachycephalic skulls. The dolichocephaly of urban residents, he believes, is due largely to food-habits which tend,

Regnault—*Continued.*
together with less painful physical labors, to develop a slim rather than a thick-set type, and to a narrow chest correspond a long face and a dolichocephalic skull. The discussion on this paper is given *in extenso.* M. Atgier considered that mixture of races was the only factor able to modify the cephalic index. M. Anthony also rejected the theory of the change of a dolichocephalic to a brachycephalic race (or *vice versa*) through the action of the muscles of the nape of the neck.

—— Sur deux squelettes d'adulte atteints d'achondroplasie. (Ibid., 163–165.) Brief description, measurements, etc., with 2 figures, of two skeletons of adults exhibiting achondroplasia or congenital arrest of length-development of the limbs.

Roth (H. L.) On permanent artificial skin-marks: A definition of terms. (Journ. Anthrop. Inst., Lond., 1900, XXX, misc., 116–118.) Discusses the tattoo of the Tahitians, the *moko* of the Maoris, and somewhat different processes among the West African tribes, and the Australians, Tasmanians, Melanesian and central African tribes, for which the author proposes the adoption of the terms *cicatrix* and *keloid.*

Sanson (A.) Sur la valeur caractéristique du volume des os de bovidé. (Bull. et Mém. Soc. d' Anthrop. de Paris, 1901, V^e s., II, 158–161.) The author suggests that certain "giant" specimens of *Bovidæ* still occurring may be representatives of the race known to paleolithic and neolithic man, whose bulky bones have led authorities to consider the race to which they belonged entirely extinct.

Scott (W. B.) The evolution of the mammalia. (Internat. Mo., Burlington, Vt., 1901, IV, 21–47, 224–250.) The author is of opinion that man's pedigree "is almost all 'missing links,'" and that the question of his ancestry cannot be satisfactorily answered.

Selenka (E.) Die Gleichartigkeit der Embryonalformen bei Primaten. (Biol. Cbl., Leipzig, 1901, XXI, 484–490.) Discusses briefly, with 19 figures, the form of the embryo in man, the gibbon, wanderoo, macaque, surili. The resemblance of the developmental stages of these primates and man is very striking.

Stevens (G. T.) The pose of the body as related to the type of the cranium and the direction of the visual plane. (Pop. Sci. Mo., N. Y., 1901, LIX, 390–401.) In this paper, illustrated with 16 figures, the theory is advocated that "the position of the head in respect to the body or of the shoulders in reference to the back, the carriage of the whole body in walking, and the attitude of a person in conversation, are governed in an important measure by the form of the cranium," and that "all these positions and attitudes, and even the gait of individuals, are largely modified, even in many instances controlled, by the normal position of the eyes in respect to the cranium." Long, tall (medium), and broad skulls have each their characteristic pose of body.

Sully (J.) The laughter of savages. (Internat. Mo., Burlington, Vt., 1901, IV, 379–402.) A *résumé* of our knowledge of laughter among primitive men,—Amerinds, Tasmanians, African Negroes, Polynesians, Australians, etc. The author concludes that "savage laughter is like our own in representing different levels of refinement." There coëxist infantile gayety, coarse brutal laughter (like that of our rough schoolboys), social laughter, and the beginnings of sympathetic and thoughtful laughter, and even what we call humor. Noteworthy are intertribal laughter and laughter at foreign customs and ideas, "one expression of the self-protective attitude of a community against insidious outside influences." Inter-sex laughter is also very common. The savage intelligence is quite fecund in practical jokes, and many savage peoples tease one another very freely indeed. The paper could be much amplified.

Thomas (N. W.) Eine internationale anthropologisch-ethnographische Bibliographie. (Globus, Brnschwg., 1901, LXXX, 37–39.) Outline of proposal for an international bibliography of anthropology and ethnography. The sections would be: General, somatology, ethnology, ethnography, prehistoric archeology. The arrangement by titles and geographically, with index of authors.

True (R. H.) Folk materia medica. (Journ. Amer. Folk-Lore, Boston, 1901, XIV, 105–114.) After a brief historical introduction, the author enumerates (with critical or explanatory remarks) "some of the articles (of animal origin) mentioned in lists of European origin dating back from one to two hundred years," instancing cases of their survival in America. Attention is also called to the recruiting of the materia medica today from the "medicine" of primitive peoples,—the American Indians, *e. g.*, have furnished cinchona, jaborandi, coca; the natives of Africa strophanthus, the Nigritians the calabar bean; the American Indians again lobelia and "mescal buttons." The conclusion arrived at is: "As slang phrases and barbarisms introduce candidates for membership into philological polite society, so the medical lore of the people does contain, and has always contained, elements capable of adaptation and use in skilled hands." Folklore is thus often the hand-maid of medicine, bringing rich sheaves from the wide fields in which she gleans.

Voss (A.) Projet de cartographie préhistorique internationale. (Anthropologie, Paris, 1901, XII, 341–345.) Proposal for an international agreement for the making of a large-quarto map embodying our knowledge of prehistoric man as indicated by the distribution of his typical remains, submitted to the Congress of 1900, discussed and acted upon.

Vram (U. G.) I cranii di gorilla (gorilla gina) del Museo di Genova. (Atti d. Soc. Rom. di Antrop., 1901, VIII, 5–11.) Gives, with 3 figures, measurements and description of four (male two, female two) gorilla skulls from the Gaboon. The cranial capacities are: Males 504, 561; females 402, 573,—the last seems to be the greatest capacity hitherto accorded for the female gorilla.

—— Un caso di saldatura precoce della sutura sagittale. (Ibid., 41–43.) Brief description, with chief measurements of a cranium (belonging to an individual not over 17 years of age) from the Museum of Aquileia, showing precocious synostosis of the sagittal suture. This case proves, Dr Vram thinks, that the bregmatic bone is independent and can unite with either the parietals or the frontal.

Wilser (L.) Migrations préhistoriques. (Anthropologie, Paris, 1901, XII, 346–348.) A resurrection of the Quatrefages-Penka theory of the Polar origin of the human race and its subsequent modifications due to a southward drift. Paper presented at Congress of 1900.

—— Geschichte und Bedeutung der Schädelmessung. (Verh. d. naturh.-med. Ver. zu Heidelberg, 1901, VI, 449–470.) Historical aperçu and critical discussion of the significance of craniometry, which, in spite of the extravagant theories based on indices, race-types, etc., has a real value for science.

EUROPE

Adamek (K. V.) Divadelni hra lidová selské vojně z XVIII. stoleti. (Český Lid, Praha, 1901, XI, 257–262, 354–356.) Text of a folk-play of the peasants' war of the 18th century. Second and last parts.

Almgren (O.) Gotlandische Grabfunde der alteren Eisenzeit. (Cbl. f. Anthrop., Jena, 1901, VI, 257–263.) Preliminary account of the occurrence of graves of the older Iron age (Montelius' periods I–V, 500 B.C. to 400 A.D.) on the Island of Gotland, which is very rich in the graves of the Iron age. The contents of the graves are briefly indicated. The richer cemeteries begin with Montelius' third period. No grave, so far, belongs to the second period. In Period I skeleton graves are more common than cremations; the graves of Period III are exclusively cremational; in the first part of Period IV skeleton, and in the second, cremational graves predominate; the graves of Period V resemble those of the previous period. During the second part of the fifth period many local Gotland types of implements and instruments (*e. g.* fibulæ) occur.

Atgier (É.) Trépied mégalithique découvert en Maine-et-Loire. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1901, v^{e} s., II, 17–18.) Brief account of a megalithic "tripod" discovered *in situ* near Cholet in the department of Maine-et-Loire, used perhaps by the Druids.

—— Observation d'oxycéphalie sur le vivant. (Ibid., 95–101.) Somewhat detailed description (with 2 figures)

Atgier—*Continued.*
and chief measurements of young man of 22 from the department of Aisne, presenting a case of oxycephaly due to an accident in childhood. But, as M. Papillault observed in the discussion, something more than the injury itself is needed to account for the subsequent synostoses.

—— Observation de scaphocéphalie sur le vivant. (Ibid., 143–147.) Brief account, with chief measurements and 2 figures, of a case of scaphocephaly in a young man of good intelligence, 21 years of age, from the department of Somme. The cause of the abnormality is said to have been a violent abdominal contusion and shock caused by a dog suddenly springing upon the mother while with child. It is, however, by no means certain that the synostosis can be explained in this manner.

Boissot (E.) Le rocher à cuvette de Vitrac. (Bull. Soc. d. Sci. et Arts de Rochechouart, 1900, X, 89–91.) Brief account of the vat-rock of Vitrac, which local legend reports to have been a measurer for the tithes of the neighboring seigneur. The basin is rather well excavated. The author suggests that it may have been a place of sacrifice in primitive times.

Boyd (Harriet A.) Excavations at Kavousi, Crete, in 1900. (Amer. Journ. Archæl., Norwood, Mass., 1901, V, 125–157.) Interesting account, with 12 figures and 5 plates (illustrating pottery specimens), of excavations carried on by the author in the early part of 1900. The tholos-tombs and house on "Thunder Hill," the so-called "citadel" of Kavousi, the bee-hive tomb at Rusty Ridge, the buildings on Azoria Hill, and later (Byzantine and Roman) remains in the region west of Kavousi plain were investigated. The earliest remains were at least three thousand years old. On the peak ("citadel") of Kavousi was discovered a stone-table for gaming,—perhaps "the earliest circular 'board' yet found in Greek lands."

Breuil (H.) L'Age du bronze dans le bassin de Paris. II. Poignards, couteaux, scies, rasoirs, ractoirs, faucilles du bassin de la Somme. (Anthropologie, Paris, 1901, XII, 283–296.) This second part of a study of the Bronze age in the Paris basin (illustrated with 4 figures, showing 38 specimens) treats of poignards, knives, saws, scrapers, sickles, etc., from the basin of the Somme, and their varieties. The evidence seems to indicate that in Picardy the first age of bronze was very little developed, and that the later portions of the period present, as to metallurgic industry, marked analogies with England on the one hand, and on the other with Switzerland, and the Jura, Charente, Berry, Champagne, and (to a less extent) Brittany.

—— Un os gravé de la grotte des Eyzies. (Rev. de l'École d'Anthrop. de Paris, 1901, XI, 226.) Brief description (with figure) of a rib-fragment engraved with the well-sculptured figure of an animal, probably a species of horse, found in the Grotto des Eyzies, on the Vézère, in September, 1900.

—— *et* **P. Dubalen.** Fouilles d'un abri à Sordes en 1900. (Ibid., 251–268.) Account of the exploration of a "shelter" of prehistoric man at Sordes in southwestern France. Stratigraphy, fauna and flora, and remains of human industry are discussed with some detail. The charcoal remains indicate that here wood (of a species of birch still existing in the vicinity) was used to keep up the fire to a greater extent than in some other contemporary shelters (Upper-Pyrenees, Upper Garonne, Ariège), where animal substances were employed, the odor of which still clings to the ashes. Among the implements found were harpoons, sculptured and painted stones, flints of diverse kinds, etc. Perhaps the most notable relic is a piece of schist with the head of a horse engraved upon it with not a little skill.

von Buchwald (G.) Der Ursprung des Rundlings. (Globus, Brnschwg. 1901. LXXIX, 293–298, 319–323.) Discusses, with 3 maps, the origin, distribution, and linguistic history of the "round villages" of northern Germany, Denmark, etc. Those of the region about Quassow, Kratzeburg, and Schwichtenberg are dealt with in detail. The second part of the article is a philological discussion of the historical development of the terms *Borg*, *Dorf*, *Weih*, *Heim*, with whose conclusions one can scarcely

von Buchwald—*Continued.*
agree. It is improbable that *Borg* and *Dorf* have sprung from a root *or*, which in the earliest times signified "cave dwelling," that *Weih* is derived from a similarly ancient *ih* ("living human being"), and *Heim* from *am*, "mother." The "round villages" have generally been considered to be of Slavonic origin, but Dr von Buchwald sees in the "Borgwälle" of the later Bronze period the ancestors of the "Rundling," which may even go back to the Stone age.

—— Zur Frage nach dem Alter der Schraube. (Ibid., 285.) Against E. Krause's contention that the screw is an Eskimo invention, the author cites the Greek κοχλιον, and refers to a prehistoric needle from Schwanebeck, and a bronze sword from Ilanz, in which the screw form is clearly existent.

Butler (H. C.) The Roman aqueducts as monuments of architecture. (Amer. Journ. Archæol., Norwood, Mass., 1901, v, 175–199.) Treats, with 8 figures, of the present condition, material, treatment, design, etc., of the stone aqueducts Aqua Marcia and Aqua Claudia; the concrete Aqua Julia and Aqua Tepula; the reticulated aqueduct of Minturnæ; the concrete and brick Aqua Neroniana and Aqua Alexandrina. According to the author there are "no structures [palaces, triumphal arches, temples] upon which the true spirit of Roman strength is more clearly imprinted, none in which the Roman love for symmetry and precision is more fully demonstrated, than in the clear-cut lines of the Marcian aqueduct."

Cancalon (*Dr*) La conservation des stations quaternaires. (Anthropologie, Paris, 1901, XII, 340–342.) Brief account of discussion at International Congress of Prehistoric Anthropology and Archeology (Paris, 1900) on the question of preserving the "stations" of prehistoric man in France and other regions of Europe.

Capitan (L.) Les cupules à l'époque paléolithique et sur les milliaires romains. (Rev. de l'École d'Anthr. de Paris, 1901, XI, 184–195.) The first part treats, with 8 text-figures, of cupped stones from the paleolithic caves of Sordes, Menton, etc. These stones, the author thinks, were not tools, but rather used for some other special purpose now unknown. The remainder of the article (with 8 figures) deals with cup markings or pittings on Roman milestones in the departments of Bouches-du-Rhône, Var, etc. Their existence upon Roman milestones is interesting as indicating their survival into quite recent times. M. Capitan suggests a *rapprochement* between the pittings on these French stones and those on certain Numidian monuments described by Faidcherbe. Some of the characters engraved on the pitted milestones are said also to have a Numidian aspect.

—— La première hache acheuléenne connue. (Ibid., 219–226.) Reproduction, with 2 figures (one of the original drawing and one from a mold of the specimen itself in the British Museum), of the letter of John Bayford (dated 1715) published in Leland's *Collectanea* (Hearne's edition), which describes the finding of a flint implement, together with the skeleton of an elephant, in a field near Gray's Inn Lane by an apothecary named Conyers. This, the author, who adds some interesting comments, styles "the first known use of the Acheul type."

—— Chronique préhistorique. (Ibid., 269–272.) Brief critiques of recent works relating to prehistoric man (in France, particularly) by Pigorini, Meunier, Dubois, Girod, and Massénat. M. Capitan does not seem to place much reliance in M. Girod's theory of the successive appearance in western Europe of an Australoid (Chellean period), a Lapp-Eskimo (Solutre-Magdalène), and a neolithic race from the Orient.

—— Passage du paléolithique au néolithique. Étude, à ce point de vue, des industries du Campigny, du camp de Catenoy, de l'Yonne et du Grand-Pressigny. (Anthropologie, Paris, 1901, XII, 354–364.) Discusses, with 8 figures, the transition from the paleolithic to the neolithic as indicated by the remains of human industry found at Campigny, Catenoy, the Yonne, and Grand Pressigny. The conclusion arrived at is that this transition took place at Maz d'Azil in quite a special manner, while in the valley of the Somme, at Campigny, Catenoy, and other similar "stations" in northern France, the industrial evolution was quite different.

Capitan—*Continued.*
Campigny is clearly a "station" intermediate between the paleolithic and neolithic periods, and its relations to the origin of the neolithic in northern France justify the use of the epithet *campignien* proposed by the late M. Salmon. The station at Catenoy is probably primitively neolithic, but a little later than Campigny.

Carlsen (F.) Stonehenge. (Globus, Brnschwg., 1901, LXXIX, 283–285.) Brief account, with 2 figures, of the past and present condition of Stonehenge.

Chamberlain (A. F.) Use of plants by children. (Journ. Amer. Folk-Lore, Boston, 1901, XIV, 132–138.) Condensed translation, with alphabetic arrangement in English, of the article of Blümml and Rott (*Ztschr. d. Ver. f. Volksk.*, XI, 49–94) on the use of plants by children in German Bohemia and Lower Austria.

Chiarugi (G.) Proposta di uno studio collettivo sul peso dell' encefalo negli Italiani. (Arch. p. l'Anthrop., Firenze, 1900, XXX, 253–260.) This outline (with schedule) of a collective study of the brains of Italians has appeared also in the *Monitore Zoologico Italiano*, vol. XII.

Déchelette (J.) Les tumuli de pierres du sud-ouest de la Bohême d'après une publication récente de M. Pic. (Anthropologie, Paris, 1901, XII, 413–426.) Excellent *résumé*, with 14 figures (illustrating many specimens), of the part of the "Bohemian Antiquities" (Prague, 1900) of Dr I. L. Pic, treating of the contents of the stone tumuli of southwestern Bohemia and the culture represented by them. The people to whom these stone tumuli belong seem to have been related to the tribes to the west of them. The last period of the Bohemian tumuli is 400–200 B.C.

Dubalen (P.) *See* Breuil (H.)

Eljasz-Radzikowski (S.) Gierlachov málo známá slovenská vesnice v Tatrach. (Český Lid, Praha, 1901, XI, 305–308.) A brief account of the customs, traditions, and speech of Gierlachov, a little-known village in the Tatra region.

Ellis (Havelock). The comparative abilities of the fair and the dark. (Monthly Rev., Lond., Aug., 1901. 84–97.) A study of the subjects in the National Portrait Gallery, based on eye-color, in relation to physical and mental activity. Generally, men of thought are dark, men of action fair. Political reformers and agitators have a particularly high index of pigmentation; explorers and actors are darkest of all. The aristocracy is fairer than the general population, the new aristocracy fairer than the old. The Conservative majorities occur in the regions of the dark, broad-headed people. Race must play some part here. The studies of Ellis should be read in connection with those of Hansen in Norway.

Friedel (E.) Bericht über das Königsgrab bei Seddin. (Verh. d. Berliner Ges. f. Anthrop., 1901, 64–73.) Account, with 4 figures, of the investigation of the great "Hünengrab" at Seddin (West Prignitz), known as the Königsgrab, in January and in October, 1900. Near the grave were found several house-urns which the author thinks, in shape and construction, "imitate the Seddin grave," which must have been famed far and wide and "made an impression upon the neighboring people proportionately as that made elsewhere by an Egyptian pyramid." The grave dates from *ca.* 1000 B.C. and is one of the most remarkable prehistoric remains of Germany.

Godin (P.) Du rôle de l' anthropométrie en éducation physique. (Bull. et Mém. Soc. d' Anthrop. de Paris, 1901, v^{e} s., II, 110–134.) At the military school of St Hippolyte-du-Fort there were measured (eight times in three and one-half years) 200 youths between the ages of 14½ and 18 years. Ten measurements—height, weight, chest circumference; biacromial, thoracic, and pelvic diameters; circumferences of arm, thigh, forearm, calf of leg,—making a total of 16,000 items. From these two groups of fifty each were made, the first consisting of those addicted to physical exercise (gymnasts,—the fixed bar was the favorite apparatus), the second of non-gymnasts. Details of the results are given in the present paper which is accompanied by 13 curve-diagrams and 18 tables. The

Godin—*Continued.* chief conclusions reached are that with adolescents 14½–18 years of age, gymnastics with apparatus does not hinder growth in height; gives the chest more amplitude than it would spontaneously acquire; increases the density of the tissues and the body-weight; favors equality of growth in volume of the four members and the simultaneous enlargement of thorax and pelvis, and in a general way regulates the vital phenomena which manifest themselves in the morphologic growth of the organism. But physical education must be preceded by a study of growth. The results of extensive measurements on 200 boys aged 13 years are shortly to be published.

Hansen (R.) Zur Betonung deutscher Ortsnamen. (Globus, Brnschwg., 1901, LXXX, 48–49.) Brief discussion of the principal groups of compound German place-names, with regard to the position of the accent, as exemplified in Schleswig-Holstein. A list of the chief endings and their effect on the accentuation of the word of which they form a part is given.

Hedinger (A.) Keltische Hügelgräber im Scheithau bei Mergelstetten, Oberamt Heidenheim. (Arch. f. Anthr., Brnschwg., 1901, XXVII, 157–168.) Treats, with 20 figures, of ten grave-mounds (out of thirty, of which ten had been excavated in 1847, and five some few years before that) and their contents, of Celtic origin and belonging to the later Bronze age and Hallstatt period. The ornamentation of the urns and other vessels found is also discussed. Three sorts of burial are indicated by the remains, and the absence of weapons suggests a peaceful population. The excavations were made in August, 1899.

—— Die Kelten. (Ibid., 169–189.) A general discussion of the Celtic question,—opinions and theories ancient and modern, ethnography, culture, religion, money, Celtic type, anatomy, etc. The author admits two "types" of Celts, blond long-headed, and dark short-headed. The closer kinship of Celtic languages to the Italic tongues is noted, and the conclusion reached that "Celts and Teutons once dwelt together as one people in Germany, whence the Italic peoples migrated first, leaving the Teutons and Celts to come into contact with each other, the latter being finally overcome by the former, more youthful and powerful." Dr Hedinger seems to harbor the fear that, under the influence of Slavonic encroachments upon the national life, the Teutons may some time lose the virtues they acquired in the struggle with the Celts.

Hertzog (A.) St. Gangwolf. (Corr.-Bl. d. deutscher Ges. f. Anthrop., München, 1901, XXXII, 49–50.) Brief notes on the chapel of St Gangwolf in upper Alsace, a famous shrine, which, in all probability, continues some heathen cult of fountain or spring. The holy knight Gangwolf, perhaps replaces the vernal god, while the wolf represents the sun.

Hervé (G.) Les écossais en France. (Rev. de l' École d' Anthrop. de Paris, 1901, XI, 206–210.) Brief account of the origin of the canton of Saint-Martin-d' Auxigny in the department of Cher, and its "colony" of blonds, now more than four centuries old. The *Forêt* of St Martin has long ago disappeared but the inhabitants of the canton (occasionally called *Anglois* or *Écossais*) are still commonly known as *Forêtins*. They represent "the scarcely changed descendants of the old Scotch of the guard of Charles VII,"—from early in the 15th century till 1672, when the direct masculine line of the Stuarts of Aubigny became extinct, the seignory of Aubigny was in possession of descendants of the constable John Stuart, who aided Charles VII against the English. In manners and customs and (it is said) in dialect these people give evidence of their origin. Their patronymics are also proof of the same. The "canny Scot" peers through them still. Their physical characteristics deserve special study. Elsewhere (in the departments of the Yonne, *e. g.*) throughout France isolated families of Scotch exist,—the Jacquesson (Jackson) of Tonnerre, the Tournebranle (Turnbrowne), Anstrude (Anstruther), and many others, whose names are cited by M. Hervé. Notable also is the family of Livingston, known in France as Léviston, which became extinct in 1828, in the person of the maternal grandmother of the late P. Salmon, the archeologist. The conclusion of M. Hervé is that "the

Hervé—*Continued.*
Scotch have been an element of greater importance in our population than is generally believed,"—and to judge from the investigation of the department of the Yonne alone, many more interesting and valuable data are yet to be discovered.

—— La taille en Alsace. (Ibid., 161–177.) After a brief historical introduction the author discusses, somewhat in detail, the study of Dr Brandt, published in 1898 which embraced the military statistics for the period 1872–1894 (39,281 young men of 20 years for Upper, and 41,919 for Lower Alsace), the distribution of medium, low, and high statures, and the causes underlying these phenomena. The Alsatian seems to hold a middle place between the Frenchman and the German, being about two centimeters taller than the former and about as much shorter than the latter. The tall statures, with the exception of an "island" in the center of the province, are grouped at the extreme north and south, while in the southwest is a marked "island" of low statures. This last is attributed to factory life, the others to race or immigration, etc. M. Hervé, himself, thinks the "black spot" of low statures is due in part to professional degeneration and in part to ethnic influence.

Höfler (M.) Das Spendebrot bei Sterbefällen. (Globus, Brnschwg., 1901, LXXXX, 92–97.) An interesting account of "death-bread," "funeral meals," etc., and their analogues in Europe—Germany in particular. The names of the "death-meal" in various languages are cited, and twelve different sorts of food in use among the peoples of Germanic stock enumerated and described with some detail. Very widespread and varied in its local or individual expression is the "death-offering" in the form of food.

Imbert (M.) L'archéologie à l'exposition de 1900. (Bull. Soc. d. Sci. et Arts de Rochechouart, 1900, X, 81–87.) Part II, treating of prehistoric pottery, bronze objects, flints of various periods. The exhibit from the grotto of Tourasse in Haute-Garonne has caused MM. Darbas and Regnault to establish a "Tourassian period." The article is accompanied by three plates figuring specimens.

Kojecky (J.) Pluh. (Český Lid, Praha, 1901, XI, 263–268.) A contribution to the history of the plow (*pluh*) in Bohemia. The names of the plow and the history of the various sorts of plows are briefly discussed in relation to the neighboring Slavonic countries.

Kretz (F.) Hliněné selské obrázky na Slovácku. (Český Lid, Praha, 1901, XI, 279–282.) Treats briefly, with 2 figures, of Slovak rustic pictured earthenware.

Laville (A.) Quelques dépôts infranéolithiques ou de transition des environs de Paris (Anthropologie, Paris, 1901, XII, 349–353.) Brief description of the transitional deposits in the environs of Paris (Rue Danton, Ivry, Choisy-le-Roi, Alfortville) uniting the neolithic and the paleolithic, and their contents.

Le Braz (A.) The popular drama in Brittany. (Internat. Mo., Burlington, Vt., 1901, IV, 403–418.) Brief characterization of the hundred mysteries which the labors of M. Luzel recovered from the farms, manor-houses, etc., of Brittany. These dramatic compositions were "the sole, or almost the sole, intellectual nourishment of the genuine Bretons in times of old." At Ploujean, near Morlaix, was begun in the summer of 1808 the attempt to revive the old Breton drama, a project eloquently advocated by Gaston Paris and other scholars of eminence.

Lefèvre (A.) Le saint graal. (Rev. de l'École d'Anthr. de Paris, 1901, XI, 178–183.) Brief historical *résumé*, with citations from literature. The author points out that "the mythic furniture of few peoples has been without a metal vessel, kettle, basin, cup, consecrated by liturgy, divinized by a long memory." Hebrews, Tyrians, Greeks, Cimbri, and others had such. Behind the "holy grail" of the Celtic Christians lies the magic basin of the bards. Here we have the not uncommon mixture of heathendom and primitive Christianity.

Lehmann-Filhés (M.) Isländisches Grab aus dem 10. Jahrhundert. (Globus, Brnschwg., 1901, LXXX, 12–13.) Brief account, with illustrations of objects found, of a grave belonging to the 10th century, discovered in the summer of 1900 in northern Iceland.

Lehmann-Filhés—*Continued.*
The grave is said to be that of certain men whose names are given in the *Reykdaelasaga* (cap. XVI). They fell in a battle in 970 A.D.

Letourneau (C.) Périclès Diamandi, calculateur mental. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1901, v^e s., II, 15–17.) Brief account of the personality and achievements of Diamandi, the Ionian "mathematical prodigy," who appeared before the Society, Jan. 5, 1901. Unlike Inaudi, Diamandi is a visualizer with extraordinary memory.

von Luschan (F.) G. Schwalbe's neue Untersuchung des Neanderthal-Schädels. (Globus, Brnschwg., 1901, LXXIX, 277.) The author expresses his agreement in all essentials with Schwalbe's recent characterization of the famous Neanderthal cranium as "belonging to a form specifically, if not generically, distinct from recent man." The two Spy skulls, and perhaps the Moravian skull described by Makowsky, resemble it, while it is entirely different from the crania of Egisheim and Canstatt.

Macquart (É.) La diminution du taux de la natalité. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1901, v^e s., II, 67–72.) From the statistics of the annual averages of births, 1874–1898, in Europe (for France as compared with other European countries the showing is worse), the author finds a probable decrease of 9% for the western half of the continent. This feeble natality he attributes not to poverty, excess of population, or the like, but to civilization itself. For this reason the decrease will continue in spite of all efforts to prevent it. According to M. Dumont, who took part in the discussion of this paper, it is "diverse habits endemic in each *milieu* that produce the natality-conditions,"—not economic factors.

Majewski (E.) Bez i hebd. (Wisła, Warszawa, 1900, XIV, 527–597.) A detailed study of the elder (*Sambucus nigra* and *S. ebulus*) from the folklore and archeologic standpoint, with particular reference to Poland. The Slavonic, Greek, and Latin names of the elder all stigmatize it as the "stinking plant." The elder was known several milleniums B.C. to the Slavonic and Lithuanian peoples, so the theory which would attribute its presence among these "barbarians" to Greek culture is disproved.

Masfrand (A.) Compte rendu des fouilles faites dans les ruines gallo-romaines de Chassenon. (Bull. Soc. d. Sci. et Arts de Rochechouart, 1900, X, 91–100, 116–121, 150–153.) Part of a somewhat detailed account of the exploration of the Gallo-Roman ruins at Chassenon, a little place in Charente, 6 kilometers from Rochechouart. Out of the primitive Gaulish village of Cassinomagus grew, under Roman rule, an important center, with a temple to Diana, a palace, baths, theater, etc.

Mayer (J.) Ueber Funde von Stein-Mörsern. (Verh. d. Berliner Ges. f. Anthrop., 1901, 73.) Brief note, with 5 figures, on stonemortars of granite and sandstone from the cemetery of Bad-Reichenhall, Upper Bavaria.

Mehlis (C.) Die sogenannten Schuhleistenkeile der neolithischen Zeit. (Cbl. f. Anthrop., Jena, 1901, VI, 129–133, 193–198.) Discusses, with 7 illustrations, the last-like stone chisels found so numerously in the neolithic caves of certain parts of the Rhenish country and elsewhere in eastern Europe. The paper is based on a collection of 20 specimens of these curious implements, the measurements of which are given with other details. Most of the "chisels" are probably axes, hoes, smoothing stones, and like implements.

Menčik (F.) Rybayova sbirka českých přislovi. (Český Lid, Praha, 1900, XI, 283–286.) Numbers 140–271 of Bohemian proverbs.

Meyer (T.) La tête de la femme d'Auvernier reconstituée par M. Kollmann. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1901, v^e s., II, 62–66.) Brief description of the well-known restoration (after a well-preserved skull and observation on cadavers) of the head of a neolithic woman of the station of Auvernier, Lake Neuchâtel, with abstract of the interesting discussion following the presentation of the bust to the Society. M. Papillault, in particular, who has studied the relations between the soft and skeletal parts of the body, considered Kollmann's generalizations unjustifiable.

Schliz—*Continued.*
disposal of the corpse obtained among the same population contemporaneously, while, as intrusive, cremation (a central and northern custom) had also strayed into this region.

Schmidt (H.) Ueber die Schlackenwälle auf dem Stromberge bei Weissenberg und auf dem Löbauer Berge. (Verh. d. Berliner Ges. f. Anthrop., 1901, 164–166.) Additional note to previous article. A bowl found on the Löbauer Berge shows marks of having been formed in basketry or net-work. Another pottery-fragment seems to have belonged to a large water-vessel modeled in a hole in the ground.

Tedeschi (E. E.) Ricerche morfologiche. (Atti d. Soc. Rom. di Antrop. 1901, VII, 11–48.) This study, accompanied by numerous tables of measurements, etc., treats in detail of the morphology of 30 skulls (male 16, female 14) of mentally diseased persons from the Ferrara Asylum. The external cranium, osseous endocranium, cerebral endocranium, relations of internal and external cranium are discussed. According to Tedeschi the typical form of the human cranium is "oblique oval." Other conclusions reached are: Plagiocephaly is purely and simply a phenomenon of compensation; to a cranial morphological law of compensation corresponds a correlative cerebral one; the laws of symmetry are the same for both sexes, for normal individuals, delinquents, and those mentally diseased; asymmetries most marked in the external cranium diminish in the internal cranium, and are least in the brain; the relation of the anterior and posterior cranium, about which there has been so much discussion in the past, is, in both sexes, exclusively due to the disproportion of the glabellar mass.

Thieullen (A.) Deuxième étude sur les pierres figures à retouches intentionnelles à l'époque du creusement des vallées quaternaires. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1901, v^{e} s., II, 166–188.) Discussion, with *pièces justificatives*, of the author's theory that certain pieces of flint found in Quaternary deposits have been "retouched" or worked by the hand of man into the likenesses of the heads of animals, etc. In the discussion of this paper MM. Atgier and Capitan took ground against the author.

Träger (P.) Begräbniss-Plätze und Tumuli in Albanien und Macedonien. (Verh. d. Berl. Ges. f. Anthrop., 1901, 43–57.) Gives an account, with 58 figures, of the investigation of burial-places in mountainous Upper Albania and Macedonia and their contents. From one grave were obtained a large number of beads, some of which in form, color, technique, etc., strikingly resemble beads from Koban in the Caucasus. The exploration of the ruins of Šurda did not meet the author's expectations. The discovery of mound-graves at Lače was more notable, and the visit to the great tumulus of Hagio Elia near Saloniki.

Trojanović (S.) Alterthümliche Speisen- und Getrankebereitung bei den Slaven. (Arch. f. Anthr., Brnschwg., 1901, XXVII, 239–264.) Discusses in some detail, with citation of corresponding practices from various parts of the globe, the preparation of foods and drinks (ancient fashions) among the Servians. Removal of hair and feathers, roasting and broiling, harvesting, grain-roasting (to loosen from ears), roasted grain as food, bread-baking, egg-cooking in oat-sacks, cooking and steaming with heated stones, cooking in the stomach of an animal, use of heated stones in cheese-making, are treated of. The drinks described are: *jagurta* (like the *busa* of the Montenegrins, and the *matinitza* of the Greek shepherds, a milk-drink) comparable to the *kumiss* and *kefir* of the Russian nomads and Caucasian mountaineers, respectively; *alowina*, tasting something like the Russian *kwas*; *medowina*, a sort of mead. The use of heated stones in the preparation of wine is also noted. Likewise their employment in folk-medicine, wood-boring, etc. To stay hunger, wax is chewed, or even swallowed, and to alleviate thirst, gunpowder is swallowed. The article is accompanied by 12 figures.

Weis (A.) Die Insel Man und deren altnordische Verfassung. (Globus, Brnschwg., 1901, LXXX, 113–115.) Brief historical account of the Isle of Man and its Old Norse constitution.

Wilke (*Dr.*) Ein prähistorischer Wall im Oberholz bei Thräna. (Verh. d. Berliner Ges. f. Anthrop., 1901, 58–64.) Describes, with one figure, a long wall

Wilke—*Continued.* with graves in the wood near Thrāna, Saxony, known as the Oberholz,—the wall itself being popularly known as the "Schlossberg." Remains of quite a considerable system of walls and graves seem to occur here. The wall may be simply a district boundary, or perhaps a line of demarkation erected by the Cherusci. The vessels found about the wall belong to the period of the Lausitz type.

Wilser (L.) Ein steinzeitliches Dorf am Neckar. (Globus, Brnschwg., 1901, LXXIX, 333–336.) Describes (after Schliz), with 3 figures, the Stone-age village of Grossgartach on the Middle Neckar. This settlement, representing the prehistoric culture of Neckar valley, is of great importance.

Winter (A. C.) Russische Volksbräuche bei Seuchen. (Ibid., 301–302.) Notes on folk-customs of the Russians in the governments of Räsan, Tula, Charkov, and Tver, in regard to protecting themselves and their animals against plagues and epidemics. The burying of live cats with a dead animal (or, with certain ceremonies, in the grave of anyone dying of the plague), nightly perambulations of widows and maidens, midnight plowing, etc., figure in the list.

Zemmrich (J.) Die Zustände an der Sprachgrenze in Nordostböhmen. (Ibid., 325–332.) Detailed discussion, with map, of the relations between the German and Tschech languages in northeastern Bohemia. The Bohemian language seems to be on the aggressive, German gaining at only two points, Königinhof Jablonetz, although the national spirit of the Teutonic part of the population is now aroused.

Zenker (W.) Armes en pierre trouvées dans le diluvium de l'Oder. (Anthropologie, Paris, 1901, XII, 365–367.) Brief account (read to Congress of 1900) of a number of stone implements from the Quaternary diluvium of the Oder in Pomerania. It is very doubtful if many of these flints are really more than naturally worn fragments. Still, as such they may have been used by early man.

AFRICA

Baumann (O.) Die Töpferei der Sansibarer Negerbevölkerung. (Globus, Brnschwg., 1901, LXXX, 127–128.) Very brief description, with 3 illustrations of the process of manufacture, of the pottery of Zanzibar negroes. The native names of the articles are given.

Brielmann (P.) Fischfang und Jagd der Eingeborenen am Kwango, Kongostaat. (Ibid., 299–301.) A brief account, with 4 figures, of fishing and hunting among the natives on the Kwango. A list of the various plants used for poisoning the water in fishing is given, and the ways of trapping animals are described.

El Hachaichi (Si Mohammed). Chez les Senoussis et les Touaregs. (Rev. de Paris, 1901, VIII, 845–858.) First part of a general account of the Tuaregs and the Senussi (a pan-Moslem confraternity of the Sahara and the Sudan). Translations of several interesting elegies and other poems are given. Another article is to follow.

Garnault (P.) Les théories paléo-Égyptiennes de la circulation, de la respiration, de la phonation et de l'audition, dans leurs rapports avec la théorie du pneuma. (Bull. et Mém. Soc. d'Anthrop de Paris, 1901, V^e S., II, 43–54.) According to the author the oldest medical documents we have come from Egyptian (papyri, which are only copies, exist belonging to the XVII–XIX centuries B.C.), and from the doctrines there expounded the Greeks must have borrowed many of the germs of their scientific theories. The present paper gives in brief the old Egyptian theories of the heart and the circulation as related to phonation and audition. The names of the heart in ancient Egyptian speech mean "dancer," "walker," etc., and the pulse, which the physicians claimed to find all over the body, was named from its movement. In the old Egyptian theory of phonation the heart is the center whence the word comes,—the heart "speaks." The pneuma needful for life enters through the nostrils and the ears, and becomes the pneumatic soul,—this is not so old as the theory of the "double." Words were the souls of things, and sound the speech of objects,—largely the thing and the word expressing it were identical. Exact pronunciation of the names of the gods incorporated at least a part of them in the human pneuma. Naming, in a sense, created. The association of pneumatic ideas with fire and the

Garnault—*Continued.*
ventriloquist tradition of the voice of the dead will, the author thinks, "account in great part for cremation among Hindus, Greeks, etc., the cult of Agni, the institution of the hearth." The ancient Egyptians, like the Greeks, were ignorant of the membrane of the tympanum and the Eustachian tube. The Egyptian aurist "differed little from a European aurist of 40 years ago," in a good many of his practices. The ear-steles, according to the author, "were not *ex-voto* of cured and grateful patients, but symbolic plates offered to the gods by the living, or funerary amulets, destined to improve the hearing of the dead (somewhat deaf during life), who needed above all things to be able to hear the questions of the judges in the next world."

Giglioli (E. H.) Accetti ed ornamenti di tipo neolitico dell' Africa occidentale ed centrale. (Arch. per l'Antropol., Firenze, 1900, XXXI, 221–226.) Describes, with 3 figures, six stone hatchets from Ashanti, one from Abbeokuta in the Yoruba country, and one small hatchet from Gondokoro on the upper White Nile; also two perforated stone ornaments from Salaga in the interior of Ashanti. All are of neolithic type, and comparatively rare in these regions.

Hamy (E. T.) La grotte du Kakimbon à Rotoma, près Konakry, Guinée Française. (Anthropologie, Paris, 1901, XII, 380–395.) Somewhat detailed description, with plan and 21 figures (of implements, pottery fragments) of the grotto of Kakimbon in French Guinea, known to the whites since 1893, partially explored in 1896 by Dr Maclaud and in 1899 and later by MM. A. and L. Moutte and M. Roux, more thoroughly. No bones, human or other, were found in the cave, but the floor-strata contained an abundance of "neolithic" implements, fragments of pottery, fragments of shells, charcoal, bone, etc. Hundreds of limonite implements and some 50 labradorite axes were taken from the cave. Some of the surface specimens (shells, etc.) were doubtless recent fetish-offerings brought by the Simos, who knew the grotto long before the French occupancy of Konakry,—to them Kakimbon was a sacred place, feared by all the negroes of the littoral. The chief relics found in the grotto (which was both a workshop and a place of deposit) antedate the residence of the intrusive Mandingos, Fulahs, and Susus. Some of the oldest limonite and labradorite implements suggest comparison with those of the Falémé basin. The further exploration of this grotto has already begun.

K. (R. T.) Abseits vom Wege in Ægypten. (Globus, Brnschwg., 1901, LXXIX, 375–379.) Traveler's illustrated notes. In Egypt, the Greek Syrians have won no enviable reputation, as the current proverbs prove: "If you meet a Syrian and a serpent, let the serpent live, and kill the Syrian; the Syrian is a rascal, the Egyptian only a thief."

Karutz (*Dr*). Eine Holzfigur der Sakalaven. (Ibid., 30.) Brief description, with figure, of a wooden figurine of a woman carrying a vessel on her head. The features of the face are rather well indicated, — the mouth is particularly fine. The lower part of the left arm is missing. This figure, which was obtained from Tulear on the southwestern coast of Madagascar, may have been a sickness offering.

——Zur westafricanischen Maskenkunde. (Ibid., 361–368.) After a brief inquiry into the origin of masks, — the author himself emphasizes the difficulty of arriving at a satisfactory psychological explanation of mask-phenomena,—the *mukish* (or "devil") of the southeastern Congo basin, the Loango masks, the secret-society masks, and police-masks are referred to. Among the more noteworthy mask-societies are the Egbo of Calabar, Ogboni of Yoruba, Mumbo-jumbo, Sohba of the Vey, Purrah of the Sierra Leone coast, Taso, Poro, Bundu, etc. The article is illustrated with 12 figures.

L. (P.) Lieder im Gê-Dialect, Klein-Popo, Togo. (Ibid., 349.) Native text, German version, and musical notation of three songs in the Gê language of Togo, German Northwest Africa.

—— Namengebung und Hochzeitsbräuche bei den Togonegern. (Ibid., 350–352.) Notes on name-giving and marriage customs of the Togo negroes of German Northwest Africa. Day-names, ceremonial names, and occasion names are cited. Among the marriage customs may be mentioned post-menstruational face and body

L.—*Continued.*

painting, lying-in seclusion, etc. Worth remark is the fact that the women seldom bear more than six children, and these, by custom of the country, only at intervals of from two to four years.

Leue (A.) Ein Marsch durch Uwinsa, Deutsch-Ostafrika. (Ibid., 60–64.) This account of a march in August, 1895, through the Uwinsa country, contains some notes on Sultan Kassanula, the Wawinsa, etc.

Moeser (H.) Ein Blick auf Marokko. (Ibid., 78–83.) Notes on the present condition of Marocco, the Sultan and his entourage, slavery, the Riff pirates, etc.

Pouyaud (A.) La colonisation en Tunisie. (Bull. Soc. Sci. et Arts de Rochechouart, 1900, X, 153–155.) First part of a study of Tunis as a colony of France, dealing with the natural advantages of the country.

—— Aperçu ethnographique sur la Tunisie. (Ibid., 109–113.) Continued from a previous number. Treats briefly of Moors, Jews, Turks, Arabs. Unity of civilization does not mean immediate race-homogeneity. The Turks and Arabs have been largely pillagers.

—— Notes sur les mœurs et les coutumes arabes en Tunisie. (Ibid., 134–140.) Treats briefly of the dress, houses, medicine, marriage, food, and religion of the Tunisian Arabs. Most remarkable is the all-round placidity and indolence of these people.

Rütimeyer (L.) Ueber westafrikanische Steinidole. (Globus, Brnschwg., 1901, LXXX, 14–15.) Brief account, with 2 figures, of a small collection of stone idols from the hinterland of Sherbro West Africa. These stone idols from the island of Sherbro are said to be the first of their kind reported from Negroland. Among them are noteworthy a Janus-like double-head, and a rather finely sculptured face, the features of which suggest ancient Egyptian types. The question of their antiquity and use is an open one. The author is of opinion that there formerly existed a people acquainted with the art of stone-sculpture (the only ones in Africa besides the sculptors of Zimbawe and those of the old Nile valley), representing an epoch of art and culture hitherto unknown.

Seidel (H.) Der Kropf in Togo und Hinterland. (Ibid., 64–65.) Notes, with 2 figures, on the nature and occurrence of goitre in German West Africa, Togo, and the hinterland. Considerable difference of opinion as to the extent, cause, etc., of the disease exists which the author is seeking to clear up. In some parts goitre is said to affect women only.

—— Pfandwesen und Schuldhaft in Togo. (Ibid., 309–313.) An account from various sources, of law about borrowing and punishment for debt among the Togo negroes of German Northwest Africa. Customs connected with borrowing, material and human pledges, the seizing and redeeming processes are discussed.

Singer (—). Woelffel's Reisen im Hinterlande der Elfenbeinküste. (Ibid., 313–318.) Brief account, with map and 8 figures of Lieut. Woelffel's expedition of 1901 in the interior of the Ivory Coast. Contains notes on the natives of the region traversed. Of the shamans of the people of Gegangui wonderful tales are told. Woelffel attributes the phenomena to suggestion.

Staudinger (P.) Ueber afrikanische Gegenstände. (Verh. d. Berliner Ges. f. Anthrop., 1901, 75–76.) Contains brief account of a policeman's axe from Dahomey, the blade of which has the form of a lion.

Taramelli (A.) Quelques stations de l'âge de la pierre découvertes par l'ingénieur Pietro Gariazzo dans l' État indépendant du Congo. (Anthropologie, Paris, 1901, XII, 396–412.) Describes, with 2 plates figuring stone implements, the investigations of the "stations" of Monolithe, Sangololo, Kwilu, Tumba (in detail), Kimpese, Gongo, Kinchassa, made by Engineer Gariazzo. Some of these specimens are doubtless very ancient and the author is inclined to see a relation between certain types of them and the neolithic relics of the Nile valley, and Somaliland. The utilization of material *in situ* at the various "stations" is also of considerable interest.

Vergely (A.) Les peuplades de Guinée. (Rev. Scientif., Paris, 1901, 4^e s., XVI, 233–241.) A general account of the natives of Conakry, the capital of French Guinea. Susus, Fulas, etc. Houses, food, customs, are referred to. The author goes so far as to think the Fulas descendants of the Fellas of Egypt. A general tendency toward face-intermixture is noted.

White (F.) On the ruins of Dhlo-Dhlo in Rhodesia. (Journ. Anthrop. Inst., Lond., 1901, XXXI, 21–28.) Brief general description of the Dhlo-Dhlo or Mambo ruins, 50 miles from Bulawayo. These walled ruins are found only in the vicinity of gold-bearing localities. The gold workers were, however, preceded by an earlier race, represented by rude stone implements found in the ruins. The wall builders seem to have been the gold-workers. The paper is accompanied by a plan and 4 plates of views.

Zaborówski (M.) De l'influence de l'ancienne civilisations Égyptienne et l'Afrique occidentale. (Rev. de l'École d' Anthrop. de Paris, 1901, XI, 197–205.) *Résumé*, chiefly after the studies of Heger and Delafosse, of the evidence as an ancient Egyptian element in the culture of western Africa. Heger's Benin investigations, M. Zaborowski thinks, suggest that the art of metal-working there represented (so close to that of the Baoulé,—to which Delafosse attributes an ancient Egyptian origin) was really introduced by the Portuguese perhaps in the latter days of the XV century. The modeling skill of the negro tribes has been long known. By 1890, the Loango negroes had already copied the Eiffel tower. According to the author "the curious correlation between the propagation of circumcision and the spread of the cultivation of Oriental plants is the only positive sign of migrations anterior to the movements induced by Islamism and the arrival of Europeans on the west coast." The Mediterranean influences even reached the Soudan only in the VIII century. Bornu is the first name from this region to be mentioned by the Arabs, and that in the IX century. It is doubtless since the Maroccan conquest of Timbuctu that most of the contact has taken place. The Mandingo empire there dates from the XIV century and the dispersal of that people to the west, where they are now, is subsequent, — and *after* the Mandingos came the Fulahs, who, beginning perhaps in the XV century, had reached Futa Jallon only by the XVIII century.

ASIA

von Adelung (N.) Ueber den jüngsten Fund einer Mammuthleiche in Ostsiberien. (Globus, Brnschwg., 1901, LXXX, 85–87.) In the fall of 1900 a Cossack discovered, about 300 versts from Sredne Kolymsk, the body of a mammoth frozen in the bank of the river Beresowka. When the news of the discovery reached St Petersburg, in April, 1901, an expedition was arranged for, which began its long journey early in May, under the leadership of Otto Herz and Herr Pfitzenmayer of the Museum of the Academy of Sciences. The success of the expedition is eagerly awaited.

Aston (W. G.) The Japanese *gohei* and the Ainu *inao*. (Journ. Anthr. Inst., Lond., 1901, XXXI, 131–135.) Discusses, with a plate, the *gohei* (developed out of the shinto offerings called *nusa* by the Japanese), and the *inao*, which "are to the Ainus of Yezo what the *gohei* are to the Japanese." According to Mr Aston, "the history of the *gohei* and *Shintai* lends strong confirmation to Mr Herbert Spencer's view that fetishism is a later religious development." Moreover, there seems to be "some sort of analogy between these Japanese ideas and the Christian conceptions of the eucharistic bread or wafer as a sacrificial offering, an emblem, the seat of a divine presence, or as *le bon Dieu* himself." Some interesting points of contact between Ainu and Japanese religion are pointed out.

Baelz (E.) Ueber die Menschen-Rassen Ost-Asiens mit specieller Rücksicht auf Japan. (Verh. d. Berliner Ges. f. Anthrop., 1901, 166–189.) This valuable and interesting paper, illustrated with 6 figures and 5 plates, gives a *résumé* of the author's numerous and extensive researches in the ethnology of eastern Asia, Japan especially. Among the topics treated more or less at length are: The Aino (physical characteristics, burial-grounds); the Korean-Mantchu type; .the Mongolo-Malay; the blue marks on the skin of Mongolian chil-

Baelz—*Continued.* dren. The Aino, Dr Baelz thinks, are the eastern part of a stock allied to the Caucasian, which once occupied all northeastern Asia, but was split up and driven apart by the Mongolic and Turkic peoples. Their physical characters are proof of such connection,—there is certainly a striking resemblance between certain Russians and the Aino (the author reproduces a picture of Count Tòlstoi and that of an Ainu from Yezo). The Korean-Mantchu type is related to the primitive Chinese people, who, with the elements of their civilization, according to the author reached the valley of the Hoang-Ho from Mesopotamia (Dr Baelz agrees with some other authorities in tracing a kinship between Chinese writing and the cuneiform inscriptions), many thousands of years B.C. The Korean-Mantchu type unites the peculiarities of the Turkic peoples (who have more or less Caucasian blood) with certain marks of the Mongolic, and perhaps minor strains of Aino and also Semitic blood. It is not at all a Mongolic type *per se*. That there is any essential difference between Mongolic and Malayan, the author is inclined to deny, with Wallace. The Malayan element in Japan, Korea, etc., followed the Kuro-Siwo. The Korean-Mantchu type is nearer the European than is the real Mongolic. The blue skin-spots of the Mongolic children Dr Baelz considers "the most important distinctive Mongolic race-characteristic," not even excluding the "Mongolian eye." They occur in the children of Japanese-European marriages only when the offspring take after the Japanese parent, there are slight traces of them among the Aino where Mongolic intermixture has taken place, and they are also said to be found on Eskimo-children (Dr Baelz thinks the Eskimo Mongolic "in spite of their dolichocephaly"). In Japan, Korea, and China these three races here discussed are all present, but in differing proportions in each country. In central and southern China, the Mongolic proper predominates, farther south the Malayan, and northward the Mantchu-Korean,—the great mass of the Chinese population being perhaps a mixture of all. In central and northern Korea the Korean-Mantchu type is characteristic, in the south the Malayo-Mongolic. In the part of Japan nearest Korea (Idzumo, *e. g.*), the Mantchu-Korean type prevails, in the east and center, the Malayo-Mongolic. Traces of the Aino type (characteristic of northern Japan) are also discoverable in Korea and China. For the Aino the author sees a bright future as sharers in Japanese destiny. The influence of these eastern Asiatic peoples on the world will be great.

Dumoutier (G.) Notes de paléoethnologie, d'archéologie et de minéralogie archéolithique japonaises. (Anthropologie, Paris, 1901, XII, 371–379.) Brief *résumé* of the archeological investigations of the author, 1891–93, in various parts of Japan (read at Congress of 1900 at Paris). The chief places excavated were the kitchen-middens of Daikokushima (near Mororan), Hakodate and Otaru (Yesso), and the deposits of Omori and Okadaïra. At the last two places the industry represented is extremely rude; that of Daikokushima is much finer; at Hakodate and Otaru the degree of perfection is very remarkable, certain specimens rivalling the finest from prehistoric Denmark. Hatchets, chisels, hammers (tomahawks), spear-heads, knives and saws, arrows, ornamental stones, "bâtons," scrapers, etc.; pottery; objects of bone, horn, shell, etc., are briefly described, and the use of the various stones of the country,—quartz (little employed), jade (of foreign origin, quite exceptional), jasper, obsidian, serpentine, rock-crystal,—indicated. The pottery of the Omori kitchen-middens is very crude, and its ornamentation recalls that of pre-Columbian pottery of the United States. Some of the vases of Okadaïra (where the pottery is larger) resemble strikingly those of the Aztecs of Mexico.

d'Enjoy (P.) Le témoignage en Chine. (Rev. Scientif., Paris, 1901, 4ᵉ s., XVI, 10–11.) Brief general account of Chinese procedures as to evidence, perjury, etc.

Francke (H.) Die Dhyânibuddhas und Mânushibuddhas im Lichte der vorbuddhistischen Religion Ladakhs. (Globus, Brnschwg., 1901, LXXX, 122–125.) A brief study of the folk literature (marriage ritual in particular) of Ladakh in relation to the pre-Buddhistic religion of northern India. The *lokapalâs* of northern India, existing in folk-belief long before the Buddhas, exercised no

Francke—*Continued.*
little influence upon their development, —even the historic Gautama Buddha is brought into relation with the *lokapalâ* of the West.

Garnault (P.) Le livre de Strack sur le sang et le crime rituel des Israélites. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1901, v^{e} s., II, 135–138.) Critical review of Strack's recent book on *Blutaberglaube*. M. Garnault thinks Professor Strack shuts his eyes to the extent of human sacrifice among the ancient Hebrews and its possible influence upon fanatic sectarians. In Semites, no less than in Aryans, the barbarian sleeps, the heritage of savagery slumbers.

Goldziher (I.) Ueber Zahlenaberglauben im Islam. (Globus, Brnschwg., 1901, LXXX, 31–32.) Brief notes, with many references to literature, on Mohammedan superstitions concerning odd and even numbers. Odd numbers are the propitious ones for God and man.

Greim (G.) Merzbachers Forschungen in den Hochgebirgen des Kaukasus. (Ibid., 23–30.) This illustrated *résumé* contains brief notes on the "pope" of Mestia, and some of the mountain peoples.

Grunwedel (A.) Bilder zur Kesarsage. (Globus, Brnschwg., 1901, LXXIX, 281–283.) Treats briefly of wall-paintings from Leh representing scenes in the life of Ge-sar, a fabulous king of Tibet, or rather of the Ling people. The origin of these paintings is subsequent to the Dogra war, and are a mixture of imitation of Buddhistic cult-figures and the artist's idiosyncrasies. There are two text-illustrations.

Hagen (B.) Die Körpergrösse chinesischen Frauen. (Arch. f. Anthr., Brnschwg., 1901, XXVII, 265–266.) Table of stature of 150 Chinese (Macao) women, between the ages of 16 and 31 (the great majority 17–23), prostitutes in the district of Labuan-Deli, on the east coast of Sumatra. The average heights for the ages 16–19, 20–24, 25–31, are, respectively, 1460.7, 1468, 1498 mm., with extremes of 1640 mm. (in a woman of 19) and 1240 mm. (in a woman of 20). The average stature of southern Chinese men is 1622 mm.

Helm (O.) *und* **Hilprecht** (H. V.) Chemische Untersuchung von altbabylonischen Kupfer- und Bronze-Gegenständen und deren Alters-Bestimmung. (Verh. d. Berliner Ges. f. Anthrop., 1901, 157–164.) Gives, with 2 figures, the results of the chemical analysis of a fragment of a bronze sword from the oldest strata of the Ziggurrat at Nippur, a fragment of a stilus, a fragment from the edge of a patena, a copper nail, a fragment from the horn of a copper gazelle-head. From these investigations it appears that the old Babylonians used not only tin but also antimony to make their bronze. The oldest of the bronze fragments dates from *ca.* 5000 B.C., the latest (a bronze nail) *ca.* 300 A.D. The copper of which the two gazelle-heads (figured in the text) were made came probably from central or northwest Arabia, these lands, under the names Kimash and Milukh, being mentioned in inscriptions of *ca.* 2800 B.C. The two gazelle-heads, which are fine examples of the best art of the pre-Sargon period, are almost life-size.

Hilprecht (H. V.) *See* Helm (O.)

Hovey (E. L.) The old post-road from Tiflis to Erivan. (Nat. Geog. Mag., Wash., 1901, XII, 301–309.) Contains notes on the peoples of Russian Armenia.

Huth (G.) Ueber die neuesten archäologischen Entdeckungen in Ost-Turkistân. (Verh. d. Berl. Ges. f. Anthrop., 1901, 150–157.) Brief notes on the results of the recent investigations of Klementz in the northeastern part of East Turkestan and of the Anglo-Indian authorities (also English missionaries and travelers) in Kashgar, Kashmir, etc. Parts of the British collections have been studied by Professor Hoernle of Oxford, and parts of the Klementz collection by Radloff and Hirth. Among the objects briefly referred to are Sanskrit and Chinese writings of the 4th, 5th, and 8th centuries A.D.; wood-prints (of prayer-formulæ) dating not earlier than the 9th century A.D.; coins, seals, etc., of all sorts and periods from the first few centuries of the Christian era down to the Middle Ages; terra-cottas, figures of stone, metal, wood, etc., perhaps the most interesting being a funeral urn on which the art of several races is mingled in rather curious fashion — the urn as re-

Huth—*Continued.* stored is figured in the text. Several of the manuscripts have peculiar forms, and the method of writing in some is also out of the ordinary. From Rudloff's study of the Uigur inscriptions (wood-prints), we learn that "the Uigur writings of Turfan reveal a Turko-Buddhistic literature hitherto completely unknown," confirming the Chinese record of its existence. These studies all indicate the immense importance of East Turkestan as to language, writing, literature, ethnology, religion, art, political evolution.

Lemke (Elisabeth.) Ueber tatarische Teppich-Weberei. (Ibid., 76-77.) Brief account, with 4 figures, of a Tartar loom for carpet-weaving, based on drawings sent from Tiflis by Baron von Kutschenbach.

Marnet (M.) Les castes dans l'Inde. (Bull. Soc. d. Sci. et Arts de Rochechouart, 1900, X, 113-115.) Concluded from a previous number. The cause of the failure of India to assert supremacy over Asia or to avail itself to the full of the genius of its Aryan peoples, the author finds in the configuration of the peninsula and the omnipotence of Brahmanism in the intellectual and moral order.

McGee (W J) Asia, the cradle of humanity. (Nat. Geogr. Mag., Wash., 1901, XII, 281-290.) Interesting discussion of "human Asia," — races and peoples, culture stages, course of human progress, civilization, birth-place of mankind, antiquity of man. The author accepts the *Pithecanthropus erectus* of Dubois as giving the "starting-point for the tracing of human development on the Continent of continents," and considers Asia "the cradle of humanity, the birth-place of nations, the nursery of the world's religions." Its yellow and brown races have thus a claim upon the good-will of the western world.

Oppert (G.) Die Felsentempel von Māmallapuram, or Seven Pagodas. (Globus, Brnschwg., 1901, LXXX, 87-91, 103-107.) A general account, with 8 cuts, of the sculptured temple of the "Seven Pagodas" situated some 30 miles from Madras, one of the most wonderful monuments of all India, and a landmark to sailors on the Coromandel coast. Sea and sand now threaten them more or less with ruin.

Rösler (E.) Bericht über die für die kaiserl. russische Archäologische Commission im Jahre 1899 unternommenen archäologischen Forschungen und Ausgrabungen in Transkaukasien. (Verh. d. Berliner Ges. f. Anthrop., 1901, 78-150.) Detailed account, with 67 illustrations (pottery, implements, ornaments, etc.), of the investigation of the Imperial Russian Archeological Commission in the government of Elisabethpol, Transcaucasia. The German settlement of Helenendorf (near Elisabethpol), where some 29 graves were examined, is built upon a prehistoric cemetery. Many interesting specimens of relics of the Bronze age, especially figured pottery, were exhumed, — animal forms (in one case a row of leaping deer (?)) are common. Over some of the graves were found, placed upright, white wedge-shaped stones, some two feet long, perhaps "death-stones," or phallic symbols. One of the skulls discovered may have been that of some distinguished individual, for it had a bronze band (open at the back) round the forehead ; a bronze medallion with a chain, rings, and beads also lay near the skeleton. Grave No. 19 is noteworthy by reason of the fantastic ornamentation of the ceramic remains found therein. One of the vessels had an inscription running around the neck, which, by some of its characters, suggests relations with Hebrew, Arabic, and Persian, while others recall the hieroglyphs and cuneiform writing. Some of the animal forms on the pottery appear to be either caricature or imaginary sketches. On a vessel from grave No. 204 is depicted a man shooting an antelope with bow and arrows, while immediately above him is a large swastika. On another urn are the figures of a man running and a giraffe-like animal in front of him, over part of whose body are scattered what appear to be hieroglyphs. These excavations have resulted in the discovery of much interesting material for the study of primitive art.

Roth (H. L.) Note on a Hkoung beht set. (Journ. Anthr. Inst., Lond., 1900, XXX, misc., 66-67.) Brief description, with 6 figures, of Burmese charms or consecrated objects let into the flesh

Roth—*Continued.*
under the skin,—disks of metal, shell, pebbles, etc. These charms are marked or engraved with mystic or cabalistic characters, resembling or identical with tattoo marks.

Washburn (G.) The early history of the Turks. (Contemp. Rev., Lond., 1901, 249–263.) A general sketch of the history of the "Turks" from 545 A.D. to the end of the XIV century.

Williams (T.) The link relations of southwestern Asia. (Nat. Geogr. Mag., Wash., 1901, XII, 249–265, 291–299.) Discussion (geological, zoölogical, botanical, ethnological), with 14 maps, of "the one region of the world's surface whose written record is oldest, most continuous, and most full." From time immemorial the region in question has been "the connecting link between the three great groups of population in the Eurasian mass, and, beyond any other of earth's tracts, it has had as its share and part: *Res gestæ regum ducumque et tristia bella.*"

Zaborowski (S.) Photographies de femmes Lolo, Miao-tsé et de native de la ville de Yunnam. Collection de chaussures du sud de la Chine. (Bull. et Mém. Soc. d'Anthrop. de Paris, 1901, V^{e} S., II, 140–143.) Brief notices of the portraits of a Chinese woman of the Kwenming race from Yunnansen, of a Lolo woman from Sinen-wei-tcheu, and of a Miao-tsé woman and her child from Tsing-ngaï. The last seems to have no distinctively Mongolic characters. A list is also given of the provenience of ten pairs of shoes and a turban from various parts of southern China.

INDONESIA, AUSTRALASIA, POLYNESIA, ETC.

Archambault (M.) Les mégalithes néo-caledoniens. (Anthropologie, Paris, 1901, XII, 257–268.) Brief account (with 6 illustrations from photographs) of the Jessie stone, Pierre Henriette, Pierre Française, Roche Elise, Roche Lengereau, and other inscribed stones and rocks of New Caledonia observed by the author in 1898. The petroglyphs seem to be chiefly spirals and cruciform figures, those of the Roche Elise near Paita, which are concentric circles, being quite imposing. The Roche Lengereau contains rectangles and squares also. These monuments, M. Archambault thinks, are pre-Kanaka, although one of them is attributed by local tradition to a former New Caledonian chief who in his dying hours carved them as a memorial of his deeds. Most of the figures on these megaliths are, according to the author, of astronomical import, for he has seen the Southern Cross disposed at certain times of the year "exactly like the figure sculptured on the northern face of the Jessie stone, near the east end." But some of these cruciform figures resemble just as much the similar figures on the megaliths of Morbihan, Brittany. Phallic or generative symbols are likewise present, and perhaps a few rude attempts at the human figure. Cup-markings also occur. M. Archambault's speculations as to kinship of some of these figures with similar sculptures in Peru are well qualified with an interrogation point.

Danneil (C.) Die ersten Nachrichten über die Inselgruppe St. Matthias und deren Bewohner. (Intern. Arch. f. Ethnogr., Leiden, 1901, XIV, 112–127.) Besides an account of the first expeditions to the St Matthias islands in 1895, 1898, and 1900, Dr Danneil describes briefly the specimens obtained (spears, combs, fiber-belts, etc.), the art of weaving, canoes. Of one of the belts a detailed examination of the process of manufacture was made. Weaving was probably introduced into the St Matthias islands, the author thinks, from the Carolines. Two colored plates (10 figures) accompany the article.

Ducret (P.) Production et utilisation du "tapa" de Tahiti. (Rev. Scientif., Paris, 1901, IV^{e} S., XVI, 187–188.) Brief note, followed by French text, of the legend of Peretahi concerning the origin of *tapa*, or bark cloth.

Giglioli (E. H.) Lo strumento primitivo "Chelléen" dell' uomo quaternario in uso attuale nell' Australia. (Arch. per l'Antropol., Firenze, 1900, XXXI, 209–217.) Describes, with 3 figures, the *kalkal* of the Walooka of northern Australia, the *kargoo* of the Ikelbarra of northeastern Australia, and the *kunga* of the Pegelloburra of the same region, three stone implements of paleolithic and "Chelléen" type. These specimens are in the collection of Dr Giglioli.

Giuffrida-Ruggeri (V.) Nuove ricerche morfologiche e craniometriche. (Atti d. Soc. Rom. di Antrop., 1901, VIII, 21–40.) Gives, with a plate and 3 figures, the results of the investigation of the crania of the Anthropological Institute of the University of Rome for cases where the glabella-bregma curve is greater than the bregma-lambda, a research suggested by Schwalbe's recent study of the Neanderthal skull. Such a condition was found to be more common in European (chiefly brachycephalic) than in Melanesian skulls, but quite frequent in both. A detailed account of the twenty cases found among 396 Melanesian crania is given. The causes of this excess of the glabella-bregma curve are not the same in the Neanderthal skull, the European and the Melanesian. The facts are comparable from a craniometric but not from a morphological standpoint. Schwalbe is right in saying that a large number of Neanderthaloid characters are to be found in modern crania. But no cranium actually like the Neanderthal skull exists today. The author considers that the modern Australian blacks are superior morphologically to the man of Neanderthal and Spy.

Juynboll (H. H.) Das javanische Maskenspiel, *topeng*. (Intern. Arch. f. Ethnogr., Leiden, 1901, XIV, 41–70, 81–111.) Detailed account, with 4 colored plates and 2 figures, of the *topeng*, or mask-play of the Javanese. Name and origin, and history, are discussed in detail, the Malay texts of the accompanying stories given, with German translation, and a large number of the masks listed and described. In opposition to De Serière, the author considers the *topeng* to be of Javanese origin, and not an importation from the continent. Besides the *topeng dalang*, or classical mask-play, there exists also a more popular *topeng babakan*, or *topeng barangan*; there also existed (perhaps it is not yet extinct) a *topeng barongan*, or play with animal masks instead of the human masks of the classical play.

Kohlbrügge (J. H. F.) Longueur et poids du corps chez les habitants de Java. (Anthropologie, Paris, 1901, XII, 277–282.) Discusses, with table, height and weight of 612 individuals (men 396, young people 122, women 94) belonging to the peoples known as Javanese, Sundanese, Madurese, and Tenggerese natives of Java, comparing the results with those of previous investigators. The order of height seems to be Javanese, Tenggerese, Madurese, and Sundanese; of weight Tenggerese, Sundanese, Javanese, Madurese. For the three peoples occupying the Java plain the weight is not very different, but the mountain Tenggerese (men) are heavier, a question, perhaps, of *milieu*. These Javanese peoples are all slighter than the generality of the white race, although the climate of the island tends to the production of fat,—the nearest approach to the massivity of the European skeleton occurs with the Tenggerese. As to stature, the Javanese peoples here considered are below the European. The greater height and weight of males as compared with females has about with same proportion with the Tenggerese, Javanese, Sundanese, as to height, but only with the Tenggerese as to weight. The more rapid development of the young people among all these Javanese may be an effect of climate. This appears particularly in weight.

Kramer (A.) Der Steinnagel von Samoa nebst anderen sagenhaften Steinen. (Globus, Brnschwg., 1901, LXXX, 7–9.) Discusses, with 2 figures, a somewhat enigmatical "stone nail" from Samoa, which may be intended as a phallus. Such stones are very common in Samoa.

Langley (S. P.) The fire-walk ceremony in Tahiti. (Nature, Lond., 1901, LXIV, 397–398.) Brief eye-witness account of the performance of Papa Ita,—"a clever and interesting piece of savage magic, but no miracle." The stones used were very poor conductors of heat, so much so, indeed, that one end of a small piece might be held in the hand while the other was applied to a blow-pipe. Stones heated red-hot at one end might, therefore, be quite cool at the other, and some clever stepping of an innocuous sort rendered possible.

von Luschan (F.) Eine neue Art von Masken aus Neu-Britannien. (Globus, Brnschwg., 1901, LXXX, 4–5.) Brief account, with 3 figures, of a mask from Cape Orford (the specimen is in the Berlin Museum), New Britain, which, while resembling in certain respects the von Luschan—*Continued.* well-known *duk-duk* masks, has also something strikingly new about it, both in form and technique. The umbrella-like top of the mask has something very like a swastika upon it.

Pöch (D. R.) Geschnitzte Figuren aus Deutsch-Neu-Guinea. (Ibid., 352–354.) Brief account, with 9 figures, of certain small carved wooden figures out of a collection of some hundreds from German New Guinea in the Berlin Museum für Völkerkunde. The mask-style of the faces of some of these figures is remarkable, as are also the long beak or nose and its connection with the lower parts of the body. A number of the figures seem to be portraits, or imitated from the living.

Roth (H. L.) Maori tatu and moko. (Journ. Anthrop. Inst., Lond., 1901, XXXI, 29–64.) Treats, with 44 figures, of tattooing among the Maoris of New Zealand. Patterns, instruments used, operations, pigments, age for tattooing, professional tattooers, post-mortem tattooing, origin of patterns and designs, sex distinctions, etc., are discussed. The spiral pattern in Maori tatu and moko the author attributes to Melanesian influence. He seems to favor Taylor's view that face-tattooing is derived from an earlier face-painting. The foundation moko patterns are seven in number, but vary infinitely in detail.

Tregear (E.) The spirit of vegetation. (Ibid., 157–159.) Describes briefly the ceremonies connected with the planting of the *kumara*, or sweet potato, among the Maori of New Zealand. With these rites human sacrifices seem originally to have been connected, surviving at the beginning of the last century in the use of skulls and skeletons to promote the fecundity of crops. The *kumara* itself was regarded as a sort of god, and many taboos were enforced in relation to its planting and harvesting, both of which were very sacred.

de Vries (J. H.) Reise nach Key, Tenimber und Aru. (Globus, Brnschwg., 1901, LXXIX, 285–288.) Extracts from de Vries' account of his visit to the Key and Aru islands and Timorlaut described in *Tijdschr. v. h. Aardrijksk. Gen.*, 1900.

AMERICA

Brown (H. C.) The Indian village o Baum. (Nat. Geogr. Mag., Wash. 1901, XII, 273–274.) Brief account o the Indian village discovered in Ros county, Ohio, in 1900, the remains o which were represented at the Pan-American Exposition at Buffalo. From the relics unearthed — implements of bone and stone, pottery, ornaments, etc.—the discovery is judged an important one, and there is no suggestion of European contact.

Chamberlain (A. F.) Kootenay "medicine-men." (Jour. Amer. Folk-Lore, Boston, 1901, XIV, 95–99.) General account, with 2 illustrations from native drawings, of the shamans of the Kootenay of southeastern British Columbia and northern Idaho. One of the drawings is evidently an attempt t represent the figure of the priest, wit some reminiscences of the crucifix,— the Kootenay are more or less unde Catholic influence. When they firs came among the Indians, these shaman seem to have made no little impressio upon the missionaries and other whit men.

Daireaux (E.) Italiens et Français e Argentine. (Rev. de Paris, 1901, VII 677–709.) A general account of th Italian and French element in Arger tina, their industries, life, etc.

Ferrero (G.) Un siècle dans l'histoi d'un peuple. Parmi les Indiens d'Amé ique. (Rev. Scientif., Paris, 190 IV S., XVI, 262–266.) A general sket of the condition of the American I dians during the period 1800–190 The author counts them a disappeari people. Masters of a large part of t continent in 1800, dependents in 190 they will have vanished altogether 2000 A.D.

Fewkes (J. W.) An interpretation Katcina worship. (Journ. Amer. Fol Lore, Boston, 1901, XIV, 81–9 Among the Hopi (Moki) Indians t term *katcina* has at present three app cations: "The first, apparently t original, to a masked man personati a supernal being with totemic char teristics; the second, to a ceremon dance, in which these masked perso ators appear in public; and the thir to secular or religious images or pictu

Fewkes—*Continued.* representing these same beings." According to Dr Fewkes, the katcinas are "breath bodies of the old people reincarnated in their traditional form." In other words they are the spirits of deceased members of the clan with totemic symbolic paraphernalia characteristic of the ancients. The dances thus celebrate clan festivals or clan reunions in which the dead and the living participate. The dead or their personators are prayed to because they have power to aid the living in material ways. Katcina dances, as a rule, are "modified survivals of clan festivals in which spirit members of the clan are personated." In general, then, "katcina worship is psychologically a form of ancestor worship." The advent of agriculture has endowed some of the archaic gods with new powers. Thus, "the bear, buffalo, and antelope katcinas have become potent in bringing rain or causing crops to grow," and "the snake dance is a form of ancients' worship highly modified into a rain prayer."

Fletcher (Alice C.) The "lazy man" in Indian lore. (Ibid., 100–104.) An interesting account of the Omaha Indians' views about "laziness," with etymological-psychological interpretations of the Omaha expressions for "lazy," "energetic," "thrifty," etc. The analysis of these words indicates that the Indian "holds the individual responsible for his own actions and for the habits he permits himself to form." The moral teaching in the matter is embodied in true form in the injunction "to make arrows." To the Indian the "energetic" man is one who "directs his strength"; the idea of the "thrifty" man indicates that he has "achieved his wealth by his own effort, searching for himself and exercising powers that are like or akin to those which bring to pass all things in nature"; the term for "lazy" signifies that "he refuses to do for himself those things which belong to him to do," and really means more than our "lazy." Aphorisms, admonitions, etc., emphasize to the young the value of habits voluntarily acquired.

Förstemann (E.) Der Merkur bei den Mayas. (Globus, Brnschwg., 1901, LXXIX, 298–299.) The author argues that the hieroglyph representing, in its full form, a man squatting, which occurs in the Dresden Codex, the Troano, etc., is intended for the planet Mercury.

Giglioli (E. H.) Amuleti degli sciamani-medici di alcuni popoli del N. ov. dell' America boreale, e piu specialmente degli Haida, Tlinkit e Tsimshian. (Arch. p. Antrop., Firenze, 1900, XXX, 227–237.) Treats, with 5 figures, of the *t'ask* of the Haida, the *tsaksset* of the Tlinket, and the *habmaack* of the Tsimshian shamans. Of these amulets, which belong to Dr Giglioli's collection, and were obtained in 1891, five are of stone, two of bone.

Guevara (T.) Historia de la civilizacion de Araucanía. (Anales de la Univ., Santiago, 1901, CVIII–CIX, 307–335, 631–682.) Treats of the period 1599–1610.

Perrig (Ae.) Aus den Bekenntnissen eines Dakota-Medizinmannes. (Globus, Brnschwg., 1901, LXXX, 128–130.) German version of the "confession" (in his native language) of a Dakota "medicine-man," communicated by Father Perrig, a missionary among the Sioux. The procedure in the sweat-bath, interpretation of dreams, preparation and use of poison, etc., are referred to.

Preuss (K. T.) Die Schicksalsbücher der alten Mexicaner. (Ibid., 261–264.) Chiefly a discussion, with figure in text, of the representation on p. 16 of the *tonalamatl* of the Aubin collection, the days and weeks, the names of deities, etc.

—— Phantasieen über die Grundlagen der Kultur. (Ibid., 9–12.) Critical review of Mrs Nuttall's recent work on "Old and New World Civilizations." Dr Preuss considers a good portion of the book fantastic.

Sapper (K.) Ein Bilderkatechismus der Mazahua in Mexico. (Ibid., 125–126.) *Résumé*, with reproduction of Pater Noster, Ave, and Credo, of the article of Dr N. León in the *American Anthropologist*, 1900, II, 722–740.

Sergi (G.) Cranî Esquimesi. (Atti d. Soc. Rom. di Antrop., Roma, 1901, VII, 93–102.) Gives chief measurements and description of 24 Eskimo skulls (14 from Greenland) in the Paris Museum of Comparative Anatomy. According

Hither India; HEIN: Ethnography of the Pacific; also Anthropological exercises; HOERNES: Diluvial Man in Europe.

Bern.—BRÜCKNER: Anthropogeography; Special Ethnology.

Geneva.—PITTARD: General Anthropology; Ethnography of Africa; MERCIER: Folklore (folk-meteorology).

Lausanne.—MAURER: Literary Ethno-psychology (English Traits); Linguistic Ethno-psychology (Comparative Study of the French and German Languages); SCHENK: General Anthropology; Prehistoric Anthropology and Ethnography.

Zurich.—MARTIN: Physical Anthropology (with demonstration); Anthropometry-Anatomy (with observations on living subjects); also Craniometrical-osteometrical exercises, and Anthropological Praktikum.

A. F. CHAMBERLAIN.

International Congress of Americanists.—The Thirteenth Session of the International Congress of Americanists will be held in the halls of the American Museum of Natural History, New York City, October 20–25, 1902. The object of the Congress is to bring together students of the archeology, ethnology, and early history of the two Americas, and by the reading of papers and by discussions to advance knowledge of these subjects. Communications may be oral or written, and in French, German, Spanish, Italian, or English. All debates are expected to be brief, and no paper must exceed thirty minutes in delivery. The papers presented to the Congress will, on the approval of the Bureau, be printed in the volume of Proceedings. Members of the Congress are expected to send, in advance of the meeting, the titles, and, if possible, abstracts of their papers, to the General Secretary. The subjects to be discussed by the Congress relate to: I, The native races of America, their origin, distribution, history, physical characteristics, languages, inventions, customs, and religions. II, The history of the early contact between America and the Old World. All persons interested in the study of the archeology, ethnology, and early history of the two Americas may become members of the Congress by signifying their desire to Mr Marshall H. Saville, General Secretary of the Commission of Organization, American Museum of Natural History, New York, and remitting either direct to the Treasurer (Mr Harlan I. Smith, American Museum of Natural History), or through the General Secretary, the sum of three dollars in American money. The receipt of the Treasurer for this amount will entitle the holder to a card of membership and to all official publications emanating from the Thirteenth Session of the Congress. Mr Morris K. Jesup is President and the Duke of Loubat Vice-President of the Commission of Organization.

Philippine Hats.—Hats of the Tagals in central Luzon are made from fine splints of bamboo. The large trunks, about six inches in diameter at the base, are cut down and sawed into lengths between the joints, and these are afterward split into convenient blocks by means of a chisel. The inside wood is split into fine pieces of a suitable size and placed in the sun to dry. After the strips are thoroughly dried they are again divided by means of the thumb-nail into strands of the required width for weaving. The fine or coarse quality of the hat to be woven determines the width of the strips and the thickness of the strands. The hard outer portions of the bamboo trunks are thrown away or used for other purposes. The weaving is done by women and girls, the finer hats being woven by the old women. The start is made at the center of the crown, and the weaving is done over some kind of form. The lining of the hats is done in coiled work of slender, uniform rods of bamboo joined together by thread and is made up in the proper shape for the hat that is to be. In many examples these little rods are wrapped with prettily-colored threads and silver tinsel sewed in bands. This inner lining, overlaid with paper or palm-leaf, is generally the form over which the weaving is done. When the two parts are finished the border is made by means of hoops of bamboo neatly joined together and decorated on the outside with a false braid in black and other colors. In order to fit the hat to the head a framework of bamboo is made; frequently this is hollow and is a receptacle for cigarettes and other small articles. THOMAS W. DARRAH, Captain U. S. A.

Lectures at the École d'Anthropologie, Paris.—The Program for the year 1901–02 is as follows: *Anatomical Anthropology:* PAPILLAULT: External forms and proportions of the human body; Variations due to the social milieu. *Prehistoric Archeology:* CAPITAN: Foundations of prehistory (petrography, paleontology, industries). *Ethnography and Linguistics:* LEFÈVRE: France in the fourteenth century; Charles V and Charles VI; Hundred Years' War,—Letters, arts, languages. *Ethnology:* HERVÉ: Ethnology of Europe (Alsace). *Ethnographic Technology:* DE MORTILLET: Industry of modern savages compared with that of tertiary and quaternary man. *Biological Anthropology:* LABORDE: Biological introduction to criminal anthropology; Predisposition to criminality in the organic and functional evolution of man; Cerebral evolution of criminality. *Anthropological Geography:* SCHRADER: Terrestrial laws and human customs. *Physiological Anthropology:* MANOUVRIER: Comparative study of the sexes (sociological point of view). *Sociology (History of Civilizations):* LETOURNEAU: Ethnographic and comparative sociology.

Zoölogical Anthropology: MAHOUDEAU: Origin of man; genealogy of the *Hominidæ*.

The courses began November 1, 1901.

A. F. CHAMBERLAIN.

Dr J. Walter Fewkes, of the Bureau of American Ethnology, has returned to Washington, after three months' absence in the field. His work during this time has been a reconnoissance, preliminary to more extended study of the culture, migration, and kinship of the aboriginal peoples of central and southern New Mexico and northwestern Chihuahua, as revealed by archeological data. Information to guide him in a future choice of ruins for excavation, was collected in Socorro and Sierra counties, New Mexico, near El Paso, Texas, and in the vicinity of Casas Grandes and the western foot-hills of the Sierra Madre, Mexico. Preliminary studies were made of the remnants of Pueblo peoples near El Paso, Texas—the Tiwa at Isleta del Sur and the Piro at Senecú.

KARL WEINHOLD, a folklorist of great distinction and editor of the *Zeitschrift des Vereins für Völkskunde* (Berlin), died August 19, 1901, at the age of 78 years. At the time of his death he was a professor in the University of Berlin (since 1890). His scientific activity began in 1847 with an appeal for the study of the German-Silesian (his native) dialect, and from linguistics he passed to the wider field of folklore, which engaged his attention more and more during the last twenty years of his life. In 1891 he founded the journal above mentioned, in which most of his recent work has appeared.

DR JAKOB HUNZIKER (1827–1901) was one of the most prominent folklorists of German Switzerland. At his death he was engaged upon his *magnum opus*, a study of the Swiss house, which was to have comprised eight volumes. Of these only one—that dealing with the Canton Wallis (Valais)—has appeared, having been published at Aargau in 1900. Most of the remainder of this valuable monograph was fortunately left in a condition suitable for printing.

A LETTER from Post Office Inspector Moore, Department of St Louis, states that one D. Levering, of Jonca, Mo., who has long been engaged in counterfeiting various archeological objects and selling them as genuine, was recently tried in the United States Court at St Louis on the charge of using the mails to defraud. Judge Adams heard the case and on November 8th sentenced Levering to six months' imprisonment in the Iron County jail.

WARREN K. MOOREHEAD.

A COMMITTEE has been appointed, at the instance of the Société d' Excursions Scientifiques, to solicit funds for the erection in Paris of a monument in honor of the late Gabriel de Mortillet. Favorable response is being made, and the names of a number of American subscribers appear in the printed list distributed by the committee. M. Louis Giraux, 22, rue Saint Blaise, Paris, is the treasurer.

OF THE COURSE of nine free lectures recently delivered at the Field Columbian Museum, Chicago, the following were of an anthropologic nature: The Megalithic Monuments of Brittany, by Dr George A. Dorsey; The Houses and Family Life of the Natives of Sarawak, Borneo, and The Ceremonial and Secular Dances of the Papuans, by Dr Alfred C. Haddon.

THE BIBESCO PRIZE of 1000 francs has been awarded by the Société de Linguistique of Paris to M. Lazare Sainéan, for his work, published in Bucarest, 1900, under the title, *Influence orientale sur la langue et la civilisation romaines.*

A MEMORIAL is to be erected to J. G. Kubary, the well-known authority on Micronesia. The committee having the appeal in charge are Admiral Strauch, Legation-Councillor Rose, and Fr. Thiel, the publisher.

LUDWIG LEINER, founder of the Rosgarten Museum at Constance, and a zealous investigator of the prehistoric antiquities of that region (lake-dwellings of the Bodensee in particular), died in that city, April 2, 1901.

THE VEREIN FÜR VÖLKSKUNDE (Berlin) celebrated its first decennium on January 26, 1901. A feature of the occasion was the representation of Meklenburg folk-customs by guests from that part of Germany.

THE KONINKL. INSTITUUT VOOR DE TAAL- LAND- EN VOLKENKUNDE VAN NEDERL. INDIË celebrated on June 4, 1901, at the Hague, its fiftieth anniversary. The speaker of the occasion was Professor Kern.

LUCIANO CORDEIRO, whose death was reported early in the current year, was perpetual secretary of the Geographical Society of Lisbon, and one of its chief founders.

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INDEX TO VOLUME 3

Aboriginal American basketry, 109
— copper mines of Isle Royale, 684
Aborigines of Santa Marta, Colombia, 606
African Society, The, 588
Age of Maya ruins, 697
Algonquian animal-names, 669
— loan-word in Kiowa, 390
Alsea Indians of Oregon, 239
Altar, Owakülti, at Sichomovi, 211
Animal-names, Algonquian, 669
Anthropological Society of Paris, 591
—of Washington, proceedings of, 595; members of, 796
Antler-pointed arrows, 431
Apache fire-making, 585
Arapaho, decorative symbolism of the, 308
Archeological publication, a new, 589
— survey of Michigan, 198
Archeology at Phillips Academy, 590
—of Saginaw valley, Michigan, 286, 501, 726
Arrow wounds, 513
Arrows, antler-pointed, 431
—, poisoned, for blowguns, 589
Artifacts from Norse ruins, 202

Basketry, aboriginal American, technic of, 109
—. *See* Weaving
Beauregard, O., death of, 391
Blackfeet, lodges of the, 650
Blowguns, poisoned arrows for, 589
Bogoras, Waldemar. The Chukchi of northeastern Asia, 80
Bone painting among Indians, 701
Books, rare, relating to Indians, 270
Bowditch, C. P. Age of Maya ruins, 697; Memoranda on the Maya calendars used in the books of Chilan Balam, 129
Brain, Eskimo, 454
—, mummification of the, 294, 584

Calendars, Maya, 129
Caribou, etymology of, 587
Categories, the, 404
Ceremonies, initiation, of Wiradjuri tribes, 337
Ceremony, Maine Indian, in 1605, 387
—, new-fire, at Walpi, 438
Chalchihuitl in ancient Mexico, 227
Chamberlain, A. F. Algonquian loan-word in Kiowa, 390; Death of Olivier Beauregard, 391; Etymology of "caribou," 587; Kootenay group-drawings, 248; Lectures at German, etc., universities, 791; Lectures at École d'Anthropologie, 793; Notes by, 593; Periodical literature, 175, 366, 550, 764; Preservation of caverns and prehistoric stations, 592; Significations of Algonquian animal-names, 669
Chukchi of northeastern Asia, 80
Classification of the sciences, 601
Codices, Mexican, list of reproductions, 532
Colombia, aborigines of Santa Marta, 606
Copper mines, aboriginal, of Isle Royale, 684
Counterfeiter, archeological, punished, 794
Cushing's "Zuñi Folk Tales," 209

Darrah, T. W. Philippine hats, 793
Darwin, Charles, ill health of, 139
Dawson, G. M., obituary of, 159
Decorative symbolism of the Arapaho, 308
Dorsey, G. A. Certain gambling games of the Klamath Indians, 14; Recent progress in anthropology at the Field Columbian Museum, 737
Douglass, A. E., obituary of, 586
Drawings of the Kootenay, 248

Eaton, Harriet P. "Skeleton in armor": was it Norse or Indian? 204
Egyptian mummification, 584
Entrikin, S. J. Hollowing pipe-stems, 592
Eskimo and Samoan killers, 391
— brain, 454
— stone implements, 209
Ethnology in the Jesuit Relations, 257

Farrand, L. Notes on the Alsea Indians of Oregon, 239
Fewkes, J. W. Lesser new-fire ceremony at Walpi, 438; Owakülti altar at Sichomovi pueblo, 211; Researches of, 794

FIELD COLUMBIAN MUSEUM, anthropology at, 737
FIRE. *See* NEW-FIRE
FIRE-MAKING, Apache and Navaho, 585
FOWKE, G. On artifacts from Norse ruins, 203

GAMBLING GAMES of Klamath Indians, 14
GATSCHET, A. S., on study of Romance languages and literature, 207
GODDARD, P. E. Conscious word-making by the Hupa, 208
GRINNELL, G. B. Lodges of the Blackfeet, 650

HAGAR, S. Obituary of R. G. Haliburton, 389
HALIBURTON, R. G., obituary of, 389
HATS, Jipijapa or Panama, 206
— Philippine, 793
HILDER, F. F., death of, 205
HODGE, F. W. Death of Colonel Hilder, 205
HOLLOWING of pipe-stems, 592
HOLMES, W. H. Aboriginal copper mines of Isle Royale, 684; Use of textiles in pottery making and embellishment, 397
HOPI, Lesser new-fire ceremony of the, 438; Owakūlti altar of the, 211
HOUGH, W. Apache and Navaho fire-making, 585; Archeologic work of, 590; Development of illumination, 342
HRDLIČKA, A. An Eskimo brain, 454; Painted bone from northern Mexico, etc., 701
HUPA, conscious word-making by the, 208

ILLUMINATION, development of, 342
INITIATION CEREMONIES of Wiradjuri tribes, 337
INSTRUCTION, sophiology, the science of, 51
INTERNATIONAL CONGRESS of Americanists, 792

JESUIT RELATIONS, ethnology in the, 257
JIPIJAPA or Panama hats, 206
JOHNSTON, W. W. Ill health of Charles Darwin, 139

KILLERS, Eskimo and Samoan, 391
KIOWA, Algonquian loan-word in, 390
KLAMATH INDIANS, gambling games of, 14
KOOTENAY group-drawings, 248
KROEBER, A. L. Decorative symbolism of the Arapaho, 308

LABORATORY OUTLINES in somatology, 28
LECTURES at École d'Anthropologie, 793
— in German, etc., universities, 791
LAMB, D. S. Mummification, especially of the brain, 294
LEÓN, Nicholas, studies of, 393, 592
LOAN-WORD, Algonquian, in Kiowa, 390
LODGES of the Blackfeet, 650

MCGEE, W J. Man's place in nature, 1; Obituary of G. M. Dawson, 159
MCGUIRE, J. D. Ethnology in the "Jesuit Relations," 257
MAINE Indian ceremony in 1605, 387
MAN'S PLACE in nature, 1
MASON, O. T. Eskimo and Samoan "killers," 391; Twined weaving, 202; Technic of aboriginal American basketry, 109; Twine-making without apparatus, 207
MATHEWS, R. H. Initiation ceremonies of the Wiradjuri tribes, 337
MAYA calendars used in the books of Chilan Balam, 129
— ruins, age of, 697
MEXICAN CODICES, a list of recent reproductions, 532
MEXICO, ancient, chalchihuitl in, 227
MICHIGAN, archeological survey of, 198
—, archeology of Saginaw valley, 286, 501, 726
MILLER, JOSHUA, death of, 592
MINES, aboriginal copper, of Isle Royale, 684
MOONEY, JAMES. Death of Father William Pope, 591; Dr León's studies, 592; Death of Joshua Miller, 592; Notes by, 593
MOOREHEAD, W. K. Archeological counterfeiter punished, 794
MUMMIFICATION, Egyptian, 584
—, especially of the brain, 294

NAMES, animal, of Algonquians, 669
NAVAHO fire-making, 585
NEW-FIRE ceremony at Walpi, 438
NICHOLAS, F. C. Aborigines of Santa Marta, Colombia, 606
NORSE origin of "skeleton in armor," 204
— ruins, artifacts from, 202
NUTTALL, ZELIA. Chalchihuitl in ancient Mexico, 227

OREGON, Alsea Indians of, 239
OWAKŪLTI ALTAR at Sichomovi, 211

PAINTED SKELETON from Mexico, 701
PANAMA HATS, 206
PERIODICAL LITERATURE, 175, 366, 550, 764
PHILIPPINE HATS, 793
PHILLIPS ACADEMY, archeology at, 590

PIPE-STEMS, method of hollowing, 592
POISONED ARROWS for blowguns, 589
POPE, REV. WILLIAM, death of, 591
POTTERY MAKING, textiles used in, 397
POWELL, J. W. Classification of the sciences, 601; Sophiology, or the science of activities designed to give instruction, 51; The categories, 404
PROCEEDINGS of the Anthropological Society of Washington, 595
PUTNAM, F. W. Skeleton in armor, 388

QUIBELL, J. E. On Egyptian mummification, 584

ROCK, MILES, death of, 208
ROMANCE LANGUAGES, study of, 207
RUINS, Maya, age of, 697
RUSSELL, FRANK, Laboratory outlines for use in an introductory course in somatology, 28

SAMOAN and Eskimo "killers," 391
SANTA MARTA, aborigines of, 606
SAVAGE, progressive and stationary, 583
SAVILLE, M. H. Mexican codices, 532
SCIENCES, classification of the, 601
SERRURIER, L., death of, 591
SICHOMOVI, Owakülti altar at, 211
SIGNIFICATIONS of Algonquian animal-names, 669
SKELETON in armor, 204, 388
—, painted, from Mexico, 701
SMITH, H. I., a new archeological publication, 589; Archeological survey of Michigan, 198; Archeology of Saginaw valley, Michigan, 286, 501, 726; Obituary of A. E. Douglass, 586
SOMATOLOGY, laboratory outlines in, 28
SOPHIOLOGY, article on, 51
SPOFFORD, A. R. Rare books relating to Indians, 270
STONE IMPLEMENTS, Eskimo, 209
SYMBOLISM, decorative, of the Arapaho, 308

TECHNIC of aboriginal American basketry, 109
TEXTILES in pottery making and embellishment, 397
TWINED WEAVING, 201
TWINE-MAKING without apparatus, 207

UNIVERSITY of California, anthropology at, 582

WALPI, new-fire ceremony at, 438
WARDLE, H. N. Artifacts from Norse ruins, 202
WEAVING, twined, 201
WILLOUGHBY, C. C. Antler-pointed arrows of the southeastern Indians, 431; Twined weaving, 201
WILSON, THOMAS. Arrow wounds, 513; On Eskimo stone implements, 209; Poisoned arrows for blowguns, 589
WINSHIP, G. P. A Maine Indian ceremony in 1605, 387
WIRADJURI TRIBES, initiation ceremonies of, 337
WORD-MAKING by the Hupa, 208
WOUNDS, arrow, 513

ZUÑI FOLK TALES to be published, 209

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CONTENTS

POWELL, J. W. *Classification of the Sciences* 601
NICHOLAS, FRANCIS C. *The Aborigines of the Province of Santa Marta, Colombia* 606
GRINNELL, GEORGE BIRD. *The Lodges of the Blackfeet* (with PLATES XX–XXII) 650
CHAMBERLAIN, A. F. *Significations of Certain Algonquian Animal-names* . 669
HOLMES, WILLIAM H. *Aboriginal Copper Mines of Isle Royale, Lake Superior* (with PLATES XXIII–XXIV) 684
BOWDITCH, CHARLES P. *On the Age of Maya Ruins* 697
HRDLIČKA, ALEŠ. *A Painted Skeleton from Northern Mexico, with Notes on Bone Painting among the American Aborigines* (with PLATE XXV) 701
SMITH, HARLAN I. *Summary of the Archeology of Saginaw Valley, Michigan—III* 726
DORSEY, GEORGE A. *Recent Progress in Anthropology at the Field Columbian Museum* 737
BOOK REVIEWS 751
PERIODICAL LITERATURE, conducted by Dr A. F. Chamberlain . . . 764
NOTES AND NEWS 791
MEMBERS OF THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON . . . 796
INDEX TO VOLUME 3 798

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